The IRON AGE
June 19, 1958 A Chilton Publication The National Metalworking Weekly

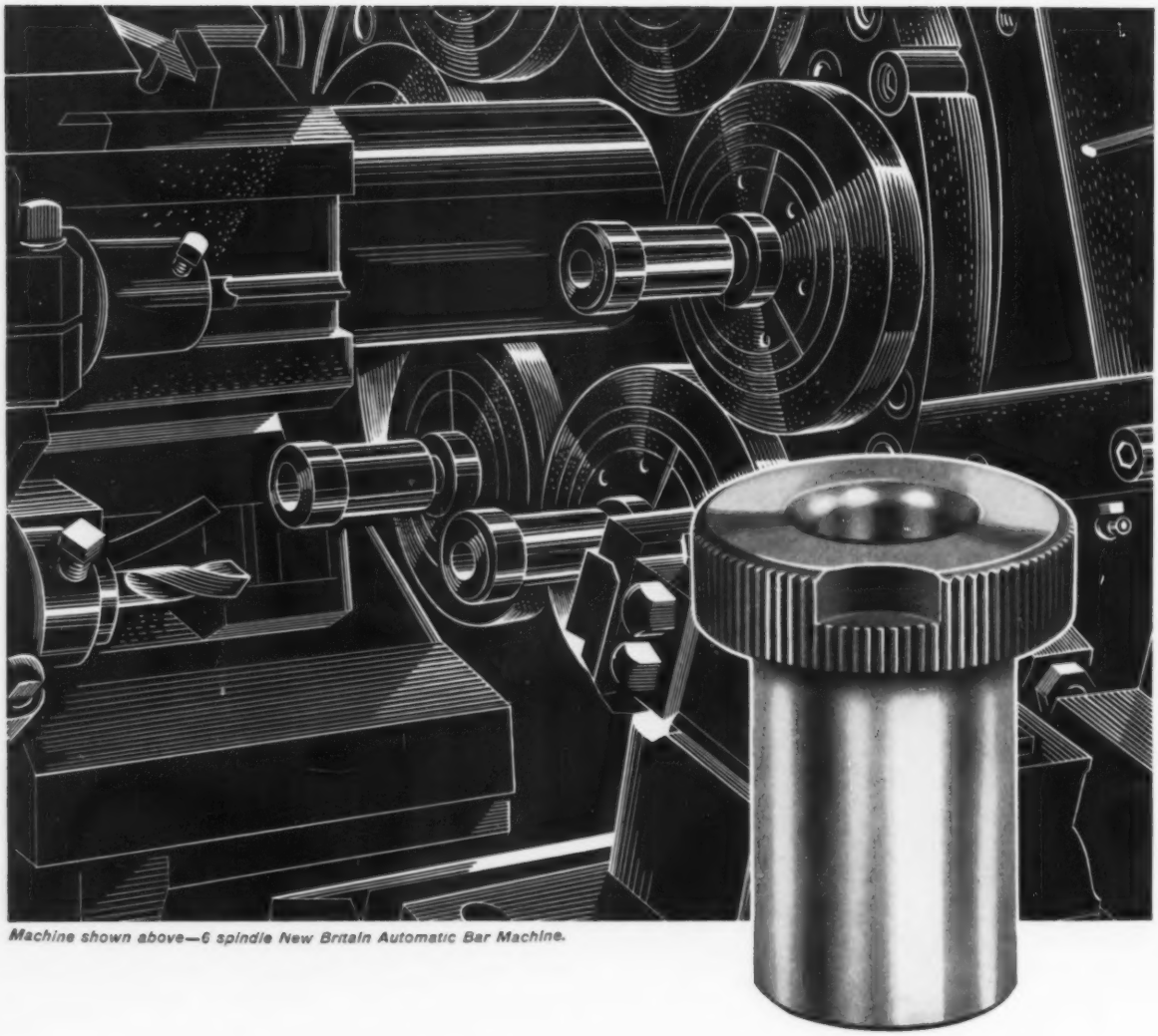
A Report from Inside Russia:

Red Industry Bids For World Leadership P. 69

Warehouses Expand Despite Business Slump – P. 75

Co-op Project Aids Machine Tool Research – P. 113

Digest of the Week P. 2-3



Machine shown above—6 spindle New Britain Automatic Bar Machine.

ARISTOLOY LEADED BOOSTED PRODUCTION 44%

Lubricating effect permitted faster feeds and speeds

JUST OFF THE PRESS
New Leaded Steel Catalog.
Write for your copy today.

A simple switch from 52100 to 52100 leaded by Universal Engineering Company for this bushing permitted spindle speeds to be increased from 234 to 351 R.P.M. Machine speed was upped from 65 to 90 S.F.M. and feed from .004 to .006 I.P.R. As a result, production of bushings jumped from 89 to 130 pieces per hour. On another bushing, the same lead-treated material increased production from 87 to 124.

In hundreds of like cases, Aristoloy Leaded, the steel with "built-in" lubrication, has helped cut machining time, increased tool life and yielded better finished parts.

Today, Copperweld offers a complete line of leaded analyses and experienced field metallurgists who will be glad to work with you to determine the best Aristoloy Leaded for cutting your machining costs.

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EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.

ARISTOLOY STEELS

XXIX

This is the twenty-ninth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Cold-Finishing of Alloy Steel Bars: Grinding and Polishing

Grinding and polishing of cold-drawn or turned alloy steel bars is the concluding discussion on the subject of cold-finishing. In the processes of turning and polishing, and grinding and polishing (both of which require removal of surface metal), the surface finish of the bars, as well as their dimensional accuracy and alignment, are improved. But the ultimate in quality of bright, smooth surface finish and accuracy is produced by grinding and polishing of either cold-drawn bars or turned bars up to 4-in. diam, inclusive.

GRINDING AND POLISHING

Sizes up to and including 4-in. diam, are generally confined to centerless cylindrical grinders. Larger sizes are ground on centers. A centerless grinder includes a grinding wheel, a regulating wheel for applying pressure against the bar, and a work-rest blade which both supports the bar and guides it between the wheel spacing. Automatic feed of the whole length of the bar is accomplished because the regulating wheel is set at an angle of inclination with respect to the grinding wheel, and thus within this system the bar rotates and feeds during grinding. The bar is then polished to a mirror-like finish by passing through straightening rolls.

Both processes of turning and polishing, and grinding and polishing, are applicable to normalized, annealed, or heat-treated carbon and alloy bars. These operations do not materially affect the mechanical properties. For this reason, the end product can be machined unsymmetrically, with little or no tendency to warp.

Fundamentals Only. In the past four advertisements, we have outlined *basic fundamentals only* on the cold-drawing of alloy bars, the effect of cold-drawing, turning and polishing, and grinding and polishing.

Please keep in mind that Bethlehem metallurgists have given long study to specifications with respect to chemical composition, grain size, hardenability, machinability, and the like, of cold-drawn alloy steel bars. If you would like additional information on cold-drawn products, or alloy steels, our metallurgists will gladly give you all possible help, without cost or obligation.

When you are ready for new supplies of alloy steels, Bethlehem can offer the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

If you would like reprints of this series of advertisements, please write to us, addressing your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. The subjects in the series are now available in a handy 40-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000

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The IRON AGE

June 19, 1958—Vol. 181, No. 25

Digest of the Week in

*Starred items are digested at right.

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Industry Looks Ahead — The slowdown in business has been no

deterrent to warehouse expansion. Growing services and products figure in big capital outlays. P. 75

FEAST AND FAMINE

Boom a Bust For Steel—Construction is running ahead of last year. But steel shipments for building are off. Trouble is uptrend is in areas that do not use heavy tonnages of steel. P. 78

COILED TINPLATE

How Much Savings — American Can invests $31 million in equipment to process coiled tinplate instead of purchasing cut sheet. Not all of the industry is convinced of major cost savings. P. 80

AUTOMOTIVE

Castings Conference—GM Central Foundry planned its conference as a customer service. But interest paid off in two-way results. It

Metalworking

SOVIET STEEL: Russia is making steady progress in steelmaking technology (for a first hand report by a visiting U. S. delegation, see p. 73). While still far behind in consumer goods, the USSR is speeding up production of machinery and industrial equipment P. 69

turned out to be the division's best creative selling tool. Plant tour demonstrates improved techniques in operation. P. 90

FEDERAL DEFICIT

Still Soaring—Deficit next year will run between $11 and $13 billion. Spending is up and tax receipts are down. And it's all very embarrassing to the Administration. Tax cuts postponed indefinitely. P. 95

FEATURE ARTICLES

MACHINING RESEARCH

On Multiple-Spindle Bar Units—A 17-firm cooperative group, called COMAPRO, is attacking machining problems common to multiple-spindle bar automatics. Spark-plug shells are the first in a series of typical workpieces to be studied. Operators stand to get a wealth of free information. P. 113

SHEET FEEDERS

Lengthen Process Runs — Feeding units adapt to many processes. At one firm, they serve slitting lines, oiling setups, and electronic counting machines. The newer models feed more sheets per run at higher rates. P. 117

PRINTED CIRCUITS

Methods Solve Foil Lifting—Improved plating baths are solving the lifting of plated circuit foils. For bright-gold plating, the answer lies in lower bath temperatures. For rhodium plating, inorganic stress reducers keep deposit stresses low. P. 118

PRECISION RUBBER PARTS

Mass-Production—A new process molds rubber parts to close dimensions without the premium usually paid for tolerances. One machine produces from 40,000 to 200,000 pieces per day. P. 121

NITRIDING, HARDENING

Combine on Low-Alloy Steel—It is possible to increase the nitrided case hardness of 4340 from Rc 57 to Rc 64 in just two seconds. These results were obtained by combining conventional nitriding practice with a high-frequency induction heating cycle. P. 122

MARKETS & PRICES

VENDING MACHINES

No Small Change—With 430,000 machines turned out last year, the vending machine industry is a growing metalworking market. But vending machines are also making headway for in-plant service. P. 81

BERYLLIUM

Aims at Wider Markets—The Beryllium Corp. has more metal to sell. But few know how to work it. The company says it needs help doing development work, tries to interest fabricators. P. 82

NEW MACHINE TOOLS

Can Industry Afford Them?—Firms who think they are being conservative by not buying new equipment should analyze their costs carefully. The cost of not buying may be the higher. P. 98

PINCH IS ON

Steel Buyers Caught Short—The rush for June delivery of steel was bigger than expected. Both mills and customers were caught off guard. You can expect more of the same until month end. P. 151

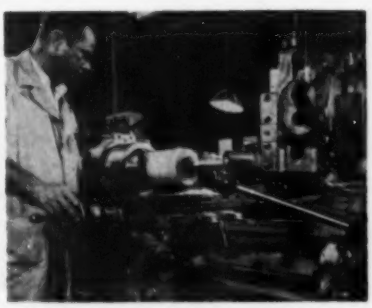
COATED ABRASIVES

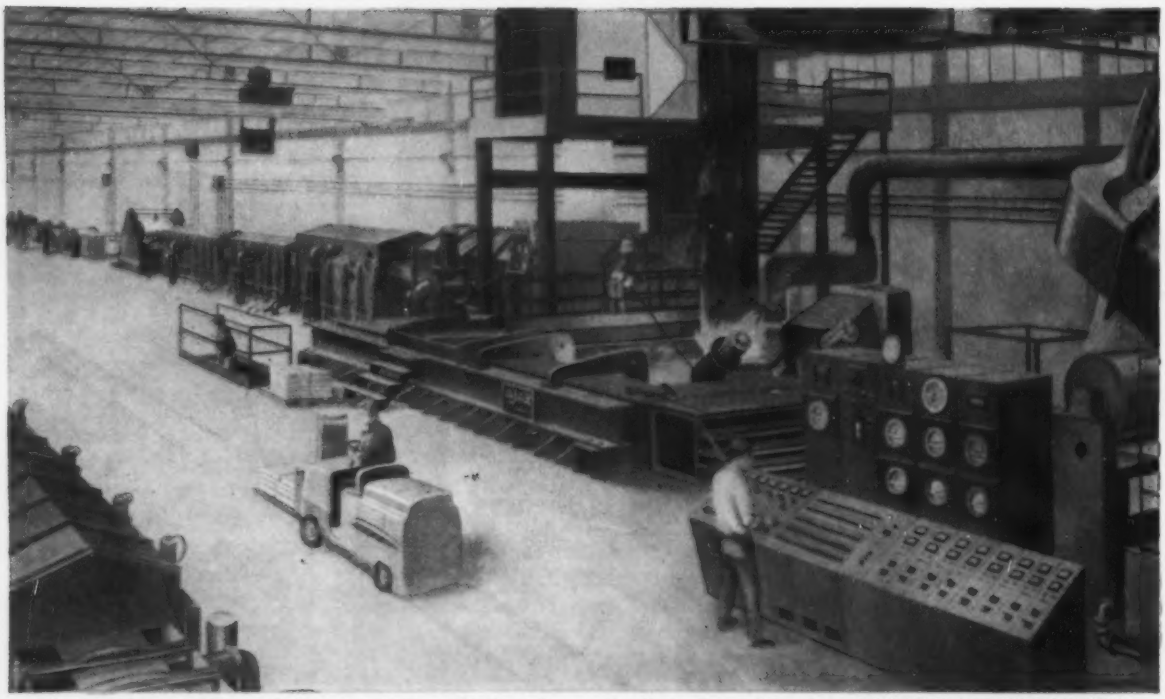
Demand Is High—The trend toward coated abrasive belt and wheel grinders is helping keep this market alive. Users can get quick delivery on any type abrasive product. P. 152

NEXT WEEK

PLASTICS

Fit in Metalworking — Whether for coatings, tooling, or many other uses, plastics have a vital place in metalworking. Next week's special report will tell you how to make them serve better and how to get more for your plastics dollar.





The above is a partial view of the two continuous galvanizing lines at the Martins Ferry, Ohio, plant of WHEELING STEEL CORPORATION. Both lines use AJAX 60 cycle induction galvanizing furnaces and zinc premelt furnaces. The main galvanizing furnace shown holds 175 tons of zinc, is rated 2000 kw, and produces over 40 tons per hour at speeds in excess of 300 feet per minute. These continuous galvanizing lines produce WHEELING's patented SOFTITE sheet.

60 Cycle induction galvanizing

has progressed from small beginnings a few years ago to a

present capacity of well over **one million tons per year.**

Here is an entirely new approach to an old art:

1. A refractory lined hearth in place of the iron kettle eliminates kettle replacement and iron pickup, drastically reduces dross formation.
2. Temperature control is precise, lag free, holds the melt at ideal galvanizing temperature at all times.
3. Gentle electromagnetic circulation facilitates alloy additions, keeps alloy uniform throughout the melt.
4. Clean and cool working conditions for hand dipping or continuous operations.

All these factors help to produce a galvanized coating of consistent superior quality and to attain high production at lowest unit costs.

MAY WE HAVE YOUR INQUIRY?

AJAX USA

60 CYCLE INDUCTION MELTING

ENGINEERING CORPORATION

TRENTON 7, NEW JERSEY

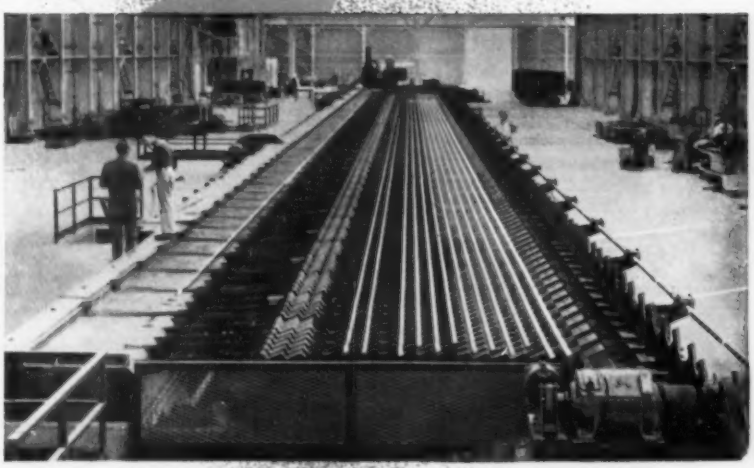
Associated Companies: Ajax Electrothermic Corporation Ajax Electric Company

MORGAN MILLS
MORGAN QUALITY

MERCHANT AND ROD MILL
Atlantic Steel Company
Atlanta, Georgia

from START to FINISH

Morgan engineered and equipped from charging car to cooling bed this new Atlantic Steel Mill is now in full operation. This mill is just one of two hundred and twenty-one Morgan continuous rolling mills which have been purchased by steel plants throughout the world.



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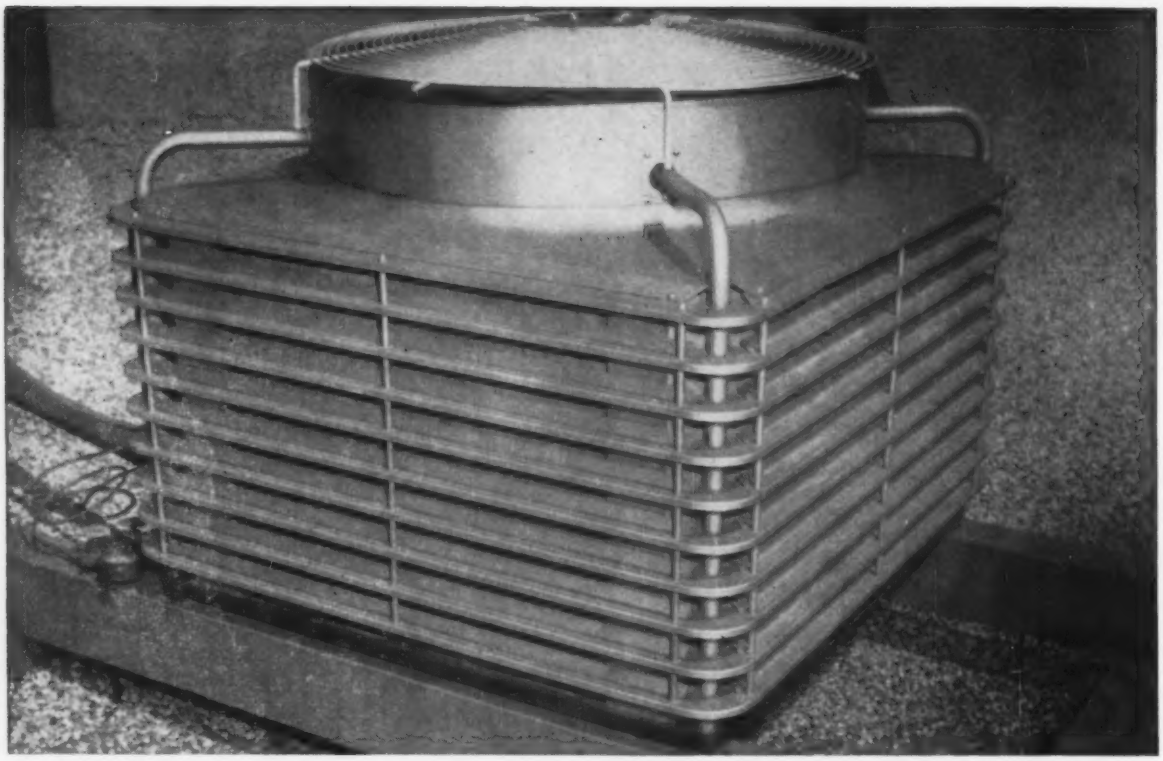
WORCESTER

MORGAN CONSTRUCTION CO., Worcester, Massachusetts

Rolling Mills • Morgoil Bearings • Wire Mills • Regenerative Furnace Control • Ejectors • Gas Producers



How Armco ALUMINIZED STEEL Type 2 Cut Costs and Improved Durability of Air Conditioner Housing

Special hot-dip aluminum-coated steel provides low-cost resistance to atmospheric corrosion, eliminates need for paint

A leading manufacturer of air conditioners formerly made the housings for the condenser units from cold-rolled steel. They had to be painted inside and out for surface protection and good appearance. Now, with all sheet metal parts made of Armco ALUMINIZED STEEL Type 2, *only the outside* is painted—and that because of a color identification of long standing.

Production Costs Down

Elimination of paint on the inside of the housing has reduced paint and labor costs 50%. And shop men report that with moderate care, parts can be fabricated of ALUMINIZED STEEL just as easily as with uncoated steel.

Better Durability

Originally the decision to use ALUMINIZED STEEL was based on tests which showed no rusting after 15 years' continuous exposure in an industrial atmosphere. Now service records prove that even under severe conditions the ALUMINIZED STEEL housings have lasting resistance to rust and corrosion, provide much longer service life.

Save on *your* production costs and give your outdoor products customer-attracting durability with the multiple advantages of Armco ALUMINIZED STEEL Type 2. Just fill out and mail the coupon for complete information.

ARMCO STEEL CORPORATION
1628 Curtis Street, Middletown, Ohio

Send me design and fabrication information on Armco ALUMINIZED STEEL Type 2.

We are considering it for_____

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COMPANY_____

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Our Standard of Living

It Doesn't Answer Everything

It is the style now to meet all questions about Soviet progress by saying we have a much higher standard of living. Surveys are now a dime a dozen showing that this is so.

We are told that we have this and that but the Reds don't. In the same breath we are warned that the Russians are making progress in heavy industry at a faster rate than we are. That figures, because they had a lower base to start from. But it's true that in many lines they are catching up.

We shouldn't have to be told that the Communist world is a dangerous threat to the type of philosophy we claim to uphold. The challenges are there for all to see. They cover progaganda, foreign diplomacy, scientific progress, trade maneuvers, and a good selling job on neutral nations.

We are told how many cars we make compared to the number made in Russia. Quality is mentioned to show that the Reds don't have our know-how (a very much overworked word that ought to come out of our lexicon).

Let's take a good look at this whole question. We aren't going to defeat Communism or pull ahead of it in foreign countries by using washing machines, dryers, shavers and what not as "ammunition." It is true that our own world likes the American way of life with its fabulous labor saving devices.

It is also true that when we continually harp on our high standard of living we are talking to ourselves; patting ourselves on the back. Hardly anyone outside our borders is interested—at least to the extent we are.

We are going to have to match Communism with more than arms, with more than lollipops, with more than TV dinners, with more than appliances and with more than repeating our standard of living gimmick.

Of course, our standard of living is high. It is good. Others like it. But spiritual outlooks are important. Friendliness to foreign countries is important. Intelligent opposition to Russia's subtle diplomacy is important.

Some day Americans may have to lead a crusade a la Point Four by giving of their brains and knowledge on the scene in backward countries. Many unsung people do it now through government, church, or other organizations. But so far this method of help hasn't scratched the surface of our foreign relations.

If we don't take a new look soon we could lose what friends we have.

Tom Campbell

Editor-in-Chief

No two stamping jobs they handle are alike

On their way to three COMMERCIAL customers are these completed stamping jobs. Jacket tops for water heaters, transformer cases, dished boiler doors—all are total strangers to each other in both design and product application.

Many times a day, every day, this same story is repeated at COMMERCIAL. Except in the case of repeated orders (a frequent occurrence at COMMERCIAL) no two jobs are alike. Their only similarity can be found in the challenges they all present—unusual shapes, close tolerances, hard-to-form metals.

COMMERCIAL offers you 30 years of metal-forming experience, complete tool and die making facilities and a "die bank" of over 20,000 adaptable components. Next time you're in the market for a medium to heavy custom stamping—to 84" in diameter or 7' x 15'—check with our engineers. Write to Commercial Shearing & Stamping Company, Dept. K-25, Youngstown 1, Ohio.

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CUSTOM STAMPING • UPSET FORGING • ROTOFORMING

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Planned Maintenance

Sir—We found your article in the May 29 issue of Iron Age relative to reducing costs and increasing profits with planned maintenance very interesting.

Would it be possible to obtain further information as to the sound detecting devices being used by the gentlemen from General Electric.—J. J. Hermes, Sales Promotion Manager, Zenith Radio Corp., Hearing Aid Div., Chicago, Ill.

Sir—Can you tell us who makes the radio equipment as shown on cover of your May 29th issue.—A. H. Voigt, President, Albert H. Voigt, Inc., Philadelphia, Pa.

▪ The radio paging system is a product of Motorola, Inc., 4545 West Augusta Blvd., Chicago, Ill.

Kind Words

Sir—Long overdue compliments are due you on your Purchasing Page and Purchasing Agents Checklist. . . . These features are excellent, but Tom Campbell's editorials alone are worth the price of the subscription.—H. J. Jungbluth, Purchasing Agent, The Oilgear Co., Milwaukee 4, Wis.

"Just as my relentless logic revealed the absurdity of his position, he fired me."

Electron-Beam Machining

Sir—The May 8 issue of IRON AGE featured a short article entitled, "Machining by Melting."

This electron-beam machining process is of significant interest to us and we would appreciate more detailed information on it.

Refer your reply to H. J. Haag, Operations Engineering Branch, Watervliet Arsenal.—T. E. Davidson, Acting Chief Asst., Watervliet Arsenal, Watervliet, N. Y.

▪ Contact E. C. Bishop, Eng. Mgr., Materials Manufacturing Dept. Metals Plant, Westinghouse Electric Corp., Blairsville, Pa.—Ed.

Cast Powder

Sir—On p. 35 of the May 1 issue of the IRON AGE there appeared an item on "Cast Powder Without Press." Can you give us more details or tell us where we can obtain more information on said process?—D. Tamor, Chief Metallurgist, American Cable Co., Inc., Reading, Pa.

▪ For further information about this item you may contact Dr. Henry H. Hausner, American Nuclear Science Corp., 61 Broadway, New York, N. Y.—Ed.

Aid-to-Education

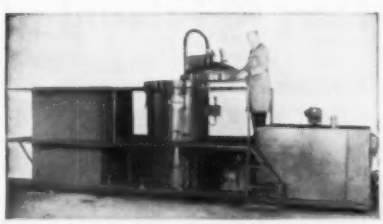
Sir—This morning I received the honorarium for my May 15 article. I gave this money immediately to the Sidney High School to be awarded to an outstanding student provided he study subjects like algebra, geometry, and trigonometry. In the future I'm going to contribute every penny deriving from similar sources to the purpose of education. Thank you very much in my own name and in the name of the boy—or girl—mathematician to be.—John Obrebski, chief metallurgist, The Monarch Machine Tool Co., Sidney, Ohio.

PRENCO

Solves Your Impregnation Problems

Eliminate Leakers... Cut Inspection Costs

Prenco Impregnation with fast-acting, deep-penetrating PORLOX Seal eliminates microscopic porosity in ferrous and non-ferrous castings of all kinds. Let Prenco engineers provide complete analysis of your products and specific impregnation recommendations.



Buy or Lease Prenco Equipment

Prenco makes it easy for you to operate production proved impregnation equipment right in your plant. Buy it if you prefer . . . or lease it for as little as a fraction of a penny per pound of castings processed. Return the coupon below for complete information.

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507 E. 10 Mile Road
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☐ Product Analysis
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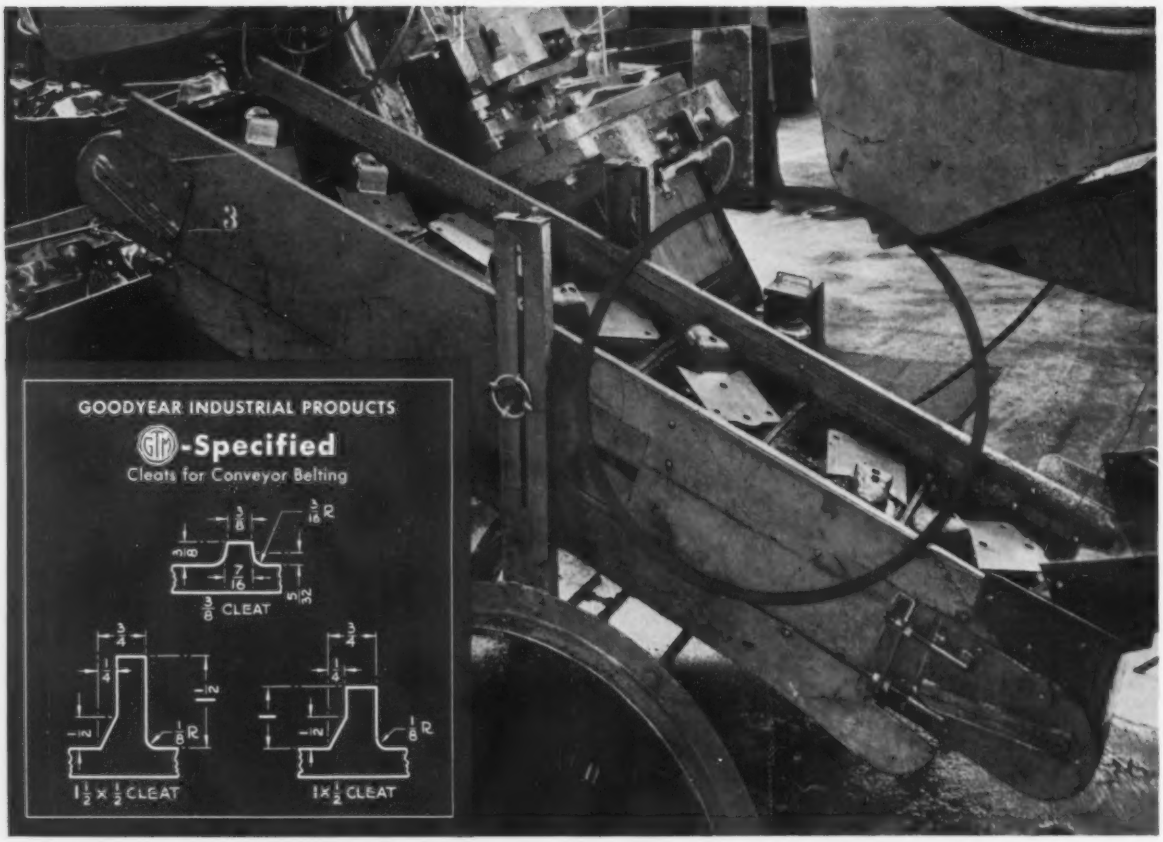


They're raising production—and lowering costs by ⅓

Portable conveyors—between production lines on different levels—were a "must" at this Midwestern automotive parts plant. But the specially constructed belts they used soon cut and flaked off. They became oil-soaked and accumulated dust—dirtying the parts. Worse still, they stretched—had to be taken up every 6 weeks. Even then, none lasted more than a year.

Then the G.T.M.—Goodyear Technical Man—recommended Style ORS Cleated Belts. They're made of rubber especially compounded for extreme resistance to oil, cutting and abrasion. And the tough, firm-gripping cleats are molded right into the rubber for durability.

The savings are impressive: The G.T.M.'s less-expensive belts eliminated the need for parts washing. And after 3 straight years of full service—*three times the life of competitive belts*—they're still going strong.

Like to have savings like these on your production lines? The fastest way to find out is to call the G.T.M. He'll be Johnny-on-the-spot if you contact your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

• • •

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

CONVEYOR BELTING BY

GOODYEAR

60th GOODYEAR ANNIVERSARY

THE GREATEST NAME IN RUBBER

FATIGUE CRACKS

Report From Russia

Editor George Sullivan reported in this week after a whirlwind tour of Russian steel mills and iron ore mines. His first-hand account of what he found there starts on page 74 of this issue. There will be other stories from time-to-time.

Meanwhile, we received some rather cryptic messages scribbled on Russian-style postcards as our fast-moving editor skipped from one industrial center to another. For instance:

"Greetings from Sverdlovsk. At airport here headed for Siberia (Ed note: Siberia?) after a 575 mph jet flight from Moscow in TU-104. Tomorrow (May 26) we start thru a mill (Chelyabinsk). Please excuse stamps—some had to be glued on." Picture on the postcard was of Kremlin, pink walls and all.

The trip was all business of course. But, like any other tourist, Editor Sullivan couldn't resist having his picture taken against some

Russian backgrounds. See Tourist Sullivan above. The background is Moscow University.

As reported earlier, George took off for Russia on May 22 as a member of a U. S. delegation of steel and iron ore experts. American Iron and Steel Institute sponsored the tour with cooperation of the U. S. Dept. of State and the Russian government. Russian experts will visit this country later this year.

As a result of the tour, Editor Sullivan opines, "there should no longer be any doubt about performance reports on Soviet steel facilities."

He adds that the American experts really worked at their jobs. They asked for and were shown blueprints of machinery and plant layout drawings. Some climbed atop openhearth furnaces.

Sound Second-String

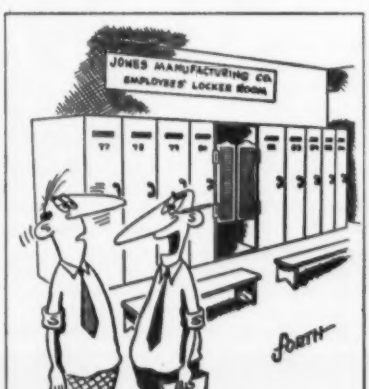
It pays to be prepared. There's a glass enclosure in a giant electronic computer at the San Jose, Calif. factory of International Business Machines. It contains a Chinese hand-operated calculator called an abacus.

Above the abacus is a wooden mallet and a sign reading, "In case of emergency, break glass."

New Puzzler

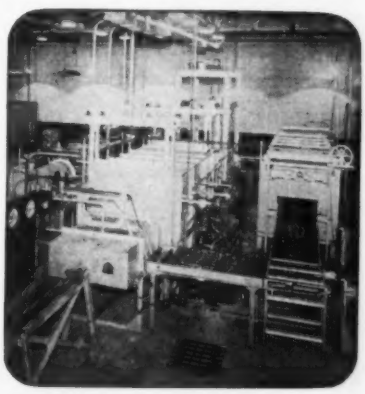
During a bad apple season a farmer bewailed his misfortune. When asked about his crop he said, "If I had as many more bushels, half as many more, and a bushel and a half, I'd have nine bushels."

How many bushels did he have?



"I'm sure the men have a bottle hidden in one of these lockers, but I don't know which one."

LABOR SAVED 50%
PRODUCTION UP 50%



R-S . . .
CONTINUOUS HARDENING, QUENCHING, DEGREASING, DRAWING LINE

It's one operation instead of four to heat treat cylinder liners at Continental Motors with the R-S equipment. Electric heat treating line is one complete unit . . . temperature is 1575° F. for hardening, it is oil quenched and the draw furnace operates at 1100° F. The atmosphere is controlled through hardening and quenching operations and capacity is 1,300 gross lbs. per hour.

R-S Heat Treating unit requires only two men instead of four with the conventional type. Production rate is up 50% . . . quality is uniformly high . . . and the unit paid for itself in 22 months.

Why not put these savings into your heat treating? Write today for your copy of the booklet on better heat treating. Ask for R-S 200. No obligation.

R-S FURNACE CO., INC.
North Wales, Pa.

Car Hearth Furnaces
Continuous Furnaces
Rotary Type Furnaces

R-S FURNACES

facts about LEDLOY* FREE-MACHINING STEELS

Considerations in the Use of Inland Ledloy Steels to Reduce Machining Costs*

"Most metalworking plants strive to trim costs as well as metal—so long as quality standards can be maintained. But it takes a lot of ingenuity and 'know how' to neatly balance all three factors: costs, machining efficiency and quality."**

INLAND LEDLOY free-machining steels should be thoroughly investigated in efforts to achieve this end.

You should consider LEDLOY STEELS . . .
. . . if you are presently producing a product from regular carbon steel that requires machining.

The Inland process of adding lead to any grade of steel phenomenally improves machinability without materially affecting other properties. The normally specified physical properties required for a particular application are retained in the equivalent Ledloy Steels. The only characteristic that is affected, and to a marked degree, is the steel's machinability.

Forgings made from Ledloy, for example, can be heat treated and forged in exactly the same manner as similar non-leaded grades of open hearth steels, yet will machine up to 50% faster. A switch to Ledloy for forgings will also result in a superior finish on the machined part.

Whatever grade of steel you are currently using for your products, if machining is an important part of your fabricating process, a change to a similar Ledloy grade can cut your total machining costs appreciably.

You should consider LEDLOY STEELS . . .
. . . if you are presently using a non-leaded machine stock.

Ledloy Grade A, the most widely used leaded steel grade, machines from 25% to 55% faster than regular free-machining steels and yet retains all the desirable characteristics of the non-leaded grade of comparable base analysis.

The precise quality control measures used by Inland in the production of Ledloy Steels result in a surface that is superior to similar non-leaded machining steels. Tolerance control is easier and the completed part has a finer, smoother finish.

You should consider LEDLOY STEELS . . .
. . . if you are presently machining parts from free-machining brass.

Ledloy Grade B, a steel that is somewhat more costly than Grade A, has been used successfully as a substitute for free-machining brass in a number of applications. The basic material cost of Ledloy Grade B is only about half as expensive as brass, yet approaches brass in machinability. However, the higher scrap return on brass, over leaded steels, must be considered in estimating overall cost savings.

If machinability rather than corrosion resistance or non-magnetic properties is the primary reason for the use of brass in a given application, Ledloy Grade B should be seriously considered for its cost-saving advantages. Because leaded steels weigh less than brass, they yield more parts per pound. Then, too, the greater strength of leaded steels often makes possible the redesigning of a machined part to obtain material savings with no loss of strength.

GENERAL CONSIDERATIONS

1. **Amount of Machining.** Ledloy Steels were developed by Inland to provide a more efficient machining steel. The advantages of their use are in direct proportion to the amount of machining performed on parts made from them. The greater the amount of machining, the greater the possible savings using Inland Ledloy Steels.
2. **Capacity of Equipment.** If your present equipment is not being run at full speeds or feeds, considerable savings can result by using Ledloy grades and taking advantage of their much greater machining rate. Increased speeds and feeds are possible, and with reduced tool wear.
3. **Surface Finish.** If finish is important in the machined product, Ledloy Steels can be beneficial. The superior finish resulting from the use of Ledloy Steels has made possible the elimination or reduction of costly additional processing in a number of applications.
4. **Tool Life.** If the machining operation wears tools excessively, necessitating frequent changes, or if tool cost is relatively high, Ledloy Steels can effect significant savings. Because of its lower friction component, plus the fact that Ledloy provides better chip formation, tool-edge build-up is cut to a minimum when machining Ledloy steels. Ledloy Steels actually lubricate the tool face, reducing heat generated and minimizing tool wear. This means greater production per tool change and decreased costs.

Many grades available—Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steels. Ask your cold-drawer about them today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

***Iron Age Special Feature #10, July 25, 1957. "How to Get More for Your Metalworking Dollar" (Machining Ferrous Metals)*

INLAND STEEL

Sales Offices: Chicago · Milwaukee · St. Paul · Davenport
St. Louis · Kansas City · Indianapolis · Detroit · New York

INLAND

Ledloy Steels
the world's most machinable
*Reg. Trade Mark

COMING EXHIBITS

Western Packaging & Materials Handling Show — Aug. 11-13, Civic Auditorium, San Francisco. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Chemical Show—Sept. 9-12, International Amphitheater, Chicago. (National Chemical Exposition, 86 E. Randolph St., Chicago 1.)

Western Tool Show—Sept. 29-Oct. 3, Shrine Exposition Hall, Los Angeles. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Packaging & Materials Handling Show—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 S. LaSalle St., Chicago 4.)

Metals Show—Oct. 27-31, Public Auditorium, Cleveland. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Plastic Show—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

MEETINGS

JUNE

Alloy Casting Institute — Annual meeting, June 21-24, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

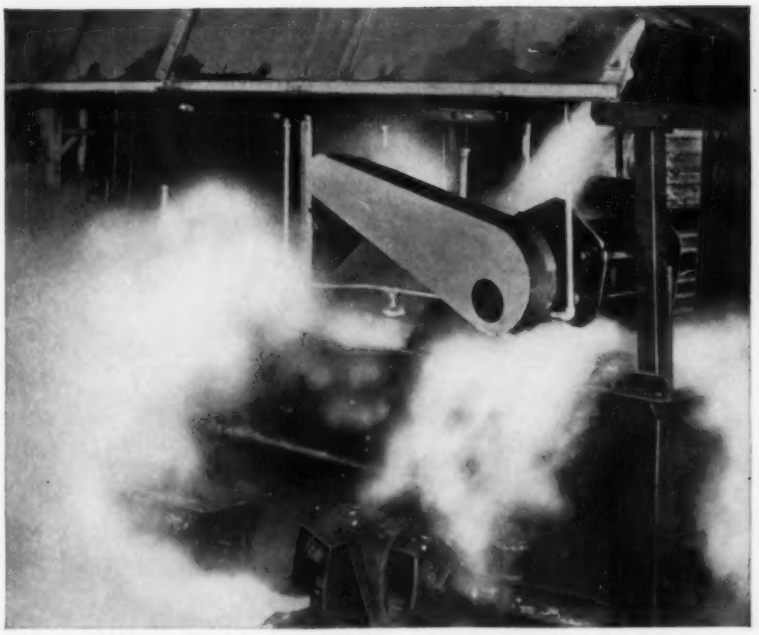
American Society for Testing Materials—Annual meeting and exhibit of scientific apparatus and laboratory supplies, June 22-27, Hotel Statler, Boston. Society headquarters, 1916 Race St., Philadelphia.

American Institute of Electrical Engineers—Summer general meeting, June 23-27, Hotel Statler-Hilton, Buffalo. Society headquarters, 33 W. 39th St., New York 18.

Investment Casting Institute — Spring meeting, June 23-25, Occidental Hotel, Muskegon, Mich. Society headquarters, 27 E. Monroe St., Chicago 3.

American Marketing Assn.— National conference, June 24-26,

(Continued on P. 16)



STOP QUENCH TANK FIRES THE INSTANT THEY START!

Most dependable fire protection on the market for one of industry's most common fire hazards: A built-in Kidde Fully Automatic Carbon Dioxide Fire Extinguishing System! Kidde systems give you 24-hour-a-day protection, guard even the most dangerous of fire hazards.

Pressure-operated for greatest dependability, Kidde systems use no falling weights, no clumsy mechanical triggering methods. Special rate-of-temperature-rise detectors trigger the system at the first sign of fire, pneumatic control heads insure instantaneous and complete carbon dioxide discharge. Automatic electric actuators also are available. In a Kidde system, all moving parts are self-enclosed for safety, and visual indicators show at a glance whether the system is "set" or "released."

WALTER KIDDE & COMPANY, INC.
545 MAIN ST., BELLEVILLE 9, N. J.

Free Kidde Systems Booklet! Get more information on fire protection for *your* plant! Send this coupon or write to Kidde for Booklet I-19 today!

NAME_____

ADDRESS_____

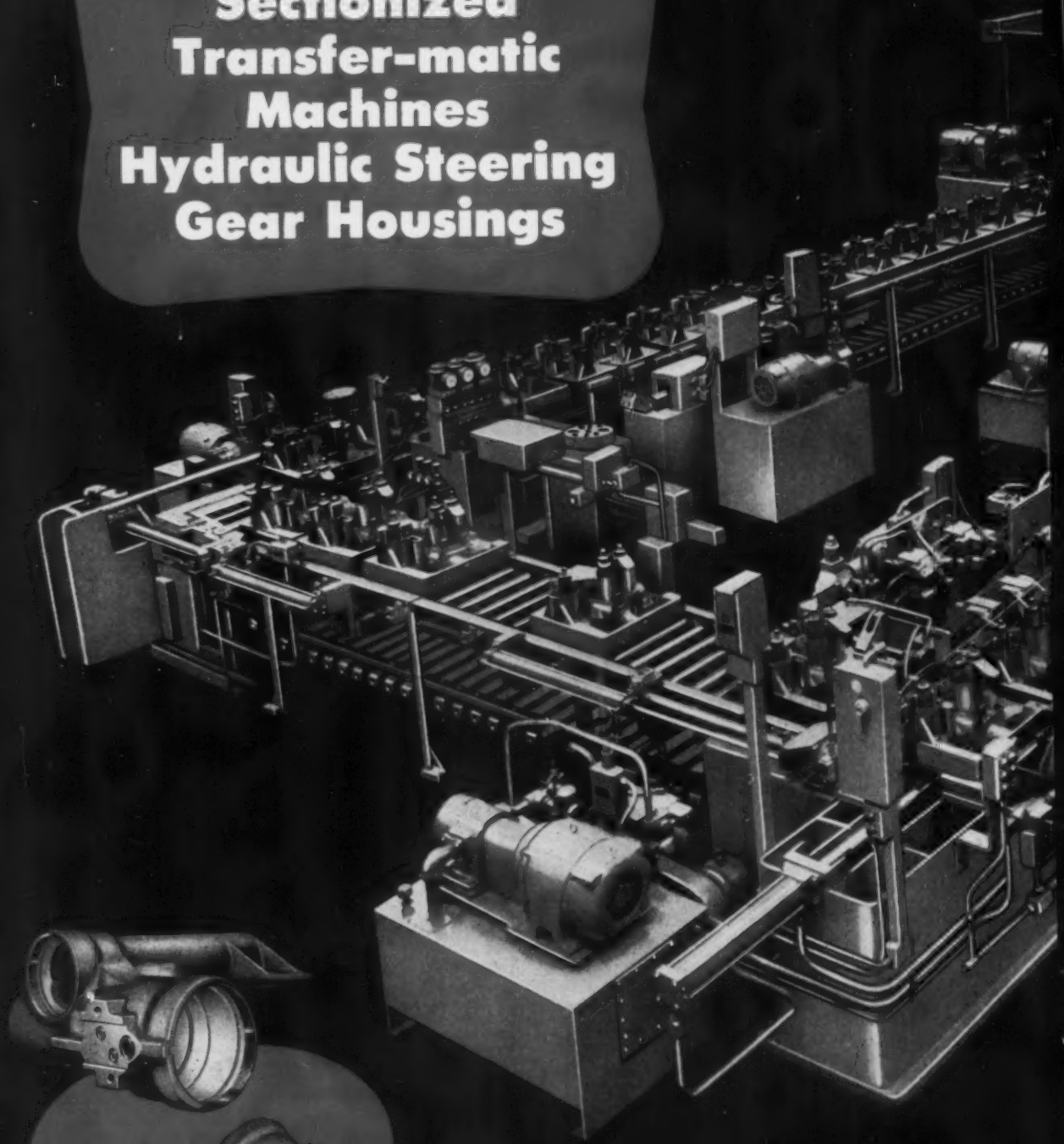
CITY_____ STATE_____

Kidde

Walter Kidde & Company, Inc.
649 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

Sectionized Transfer-matic Machines Hydraulic Steering Gear Housings



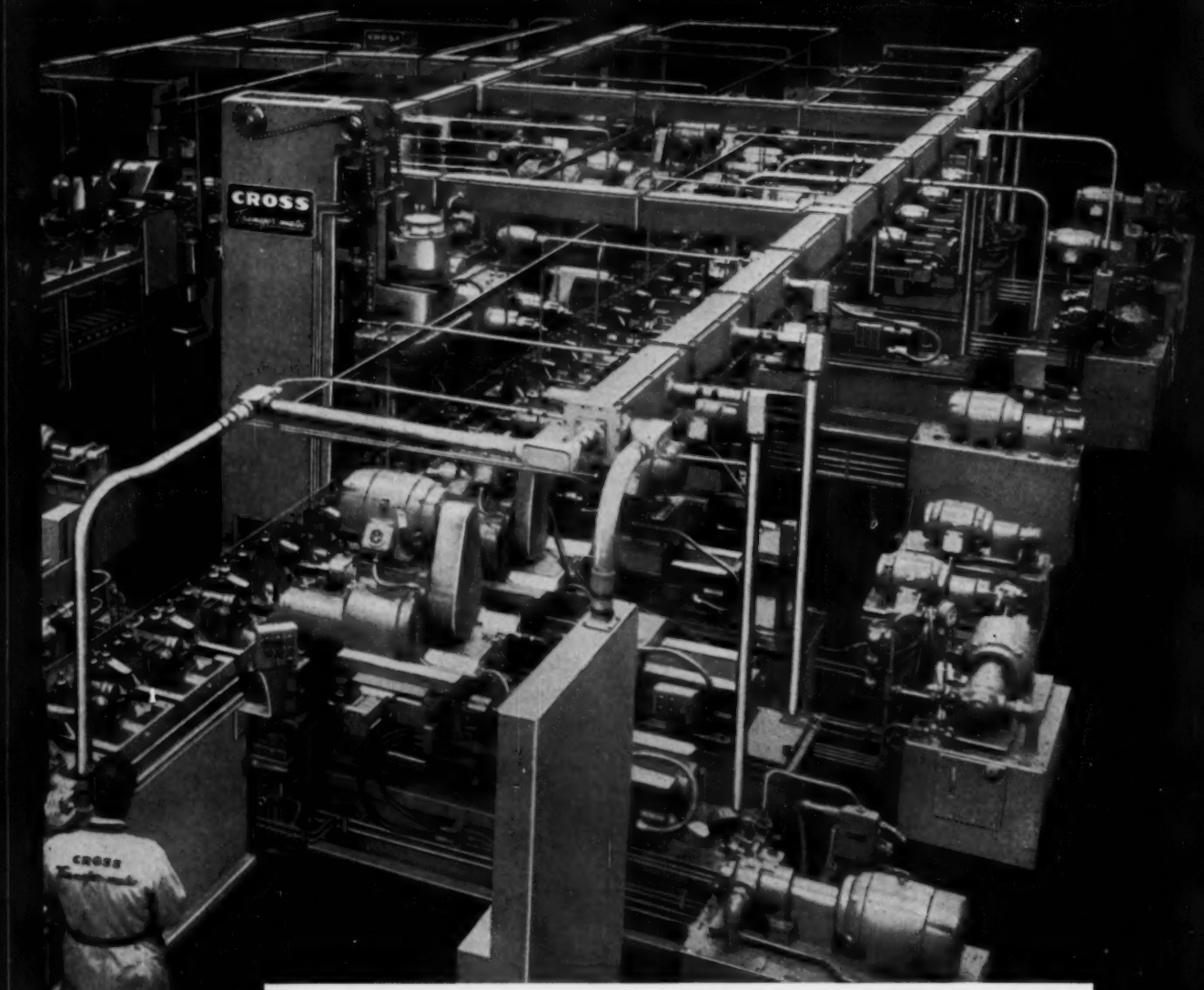
Established 1898

THE CROSS CO.

First in Automation

PARK GROVE STATION • DETROIT 5, MICHIGAN

Another Automation First by Cross



This Sectionized Transfer-matic completely machines hydraulic steering gear housings, except mounting holes which are processed in a preparatory operation. Rated capacity is 200 pieces per hour at 100% efficiency.

The housings are power clamped to pallet work holding fixtures which are transferred through three machine sections. In Section I, housings are milled, drilled, reamed, spotfaced, tapped and rough bored. Fixture clamps are then released to relieve machining strains. In Section II, single point precision boring completes the machining. Production is balanced by boring four parts simultaneously in each position. In Section III, air gages inspect the boring. Accumulating conveyors move the pallets between sections and provide banks of stock.

Three Cross Machine Control Units, with Toolometers to program tool changes, minimize downtime. Tool setting fixtures are provided to pre-set tools, thus eliminating trial cuts and adjustments.

Other features are complete interchangeability of all standard and special parts for easy maintenance, construction to JIC Standards, hardened and ground ways, and automatic lubrication.

THE PENNSYLVANIA PLAN:

100% financing for your new plant

Complete financing for Lease-Purchase of a new plant is available in labor-surplus areas of Pennsylvania through combined efforts of lending institutions, non-profit community organizations and the Pennsylvania Industrial Development Authority. Interest as low as 2%, with deferred amortization, can be applied on up to one-half of total plant cost.

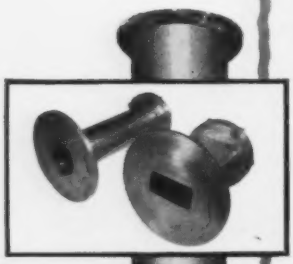
100% financing is also available in other areas of the State, provided by community organizations, banks, insurance companies and other sources. You select the community you want. You specify plant construction details or choose one of several plant "shells" now being readied for completion.

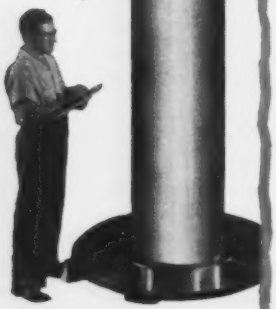
100% Financing at a glance . . .
Industrial Plant Construction Costs—

Subscribed by local non-profit community sponsored builder-owner corporations.	*20%*
2nd Mortgage Loan, Pennsylvania Industrial Development Authority.	*30%*
1st Mortgage Loan obtained from banks, insurance companies and similar lending institutions.	*50%*
Total financing, secured through local subscriptions and mortgage loans, without cash investment by the manufacturer.	*100%*

For free copy of "Plant Location Services" pamphlet, or for details on 100% financing, write or call:

Pennsylvania Department of Commerce
Main Capitol Building
1159 State Street, Harrisburg, Pa.
Phone: CEdar 4-2912





SAVE PRODUCTION TIME AND REPLACEMENT COST - HAVE ZAK FABRICATE AND MACHINE

YOUR CRUCIBLES for VACUUM MELTING

Tested and certified at the plant for pump down and leak rate measured in microns, ZAK manufactured crucibles 'hold up' under work schedules that 'break down' ordinary crucibles.

The production time saved by longer life will be high; the replacement cost — low!

VARIETY IN SIZE AND SHAPES
Zak manufactures any size or shape from 20 lb. evaluation to production crucibles producing ingots in excess of 6 tons.

ZAK MACHINE WORKS, INC., are engineering manufacturers of special Vacuum Applications for Melting, Annealing and Processing.

ZAK MACHINE WORKS INC.
TROY (GREEN ISLAND) N. Y.

EXHIBITS, MEETINGS

Continued from P. 13)

Harvard Graduate School of Business, Boston. Society headquarters, 27 E. Monroe St., Chicago 3.

Industrial Safety Equipment Assn., Inc.—Annual meeting, June 24-27, Oyster Harbors, Osterville, Mass. Society headquarters, 420 Lexington Ave., New York.

Drop Forging Assn.—Annual meeting, June 25-28, The Homestead, Hot Springs, Va. Information: D. M. Allgood, exec. vice president, Drop Forging Assn., Cleveland 13.

JULY

Truck-Trailer Manufacturers Assn.—Summer meeting, July 14-16, Homestead, Hot Springs, Va. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

SEPTEMBER

National Petroleum Assn.—Annual meeting, Sept. 10-12, Hotel Traymore, Atlantic City, N. J. Society headquarters, Munsey Bldg., Rm. 958, Washington, D. C.

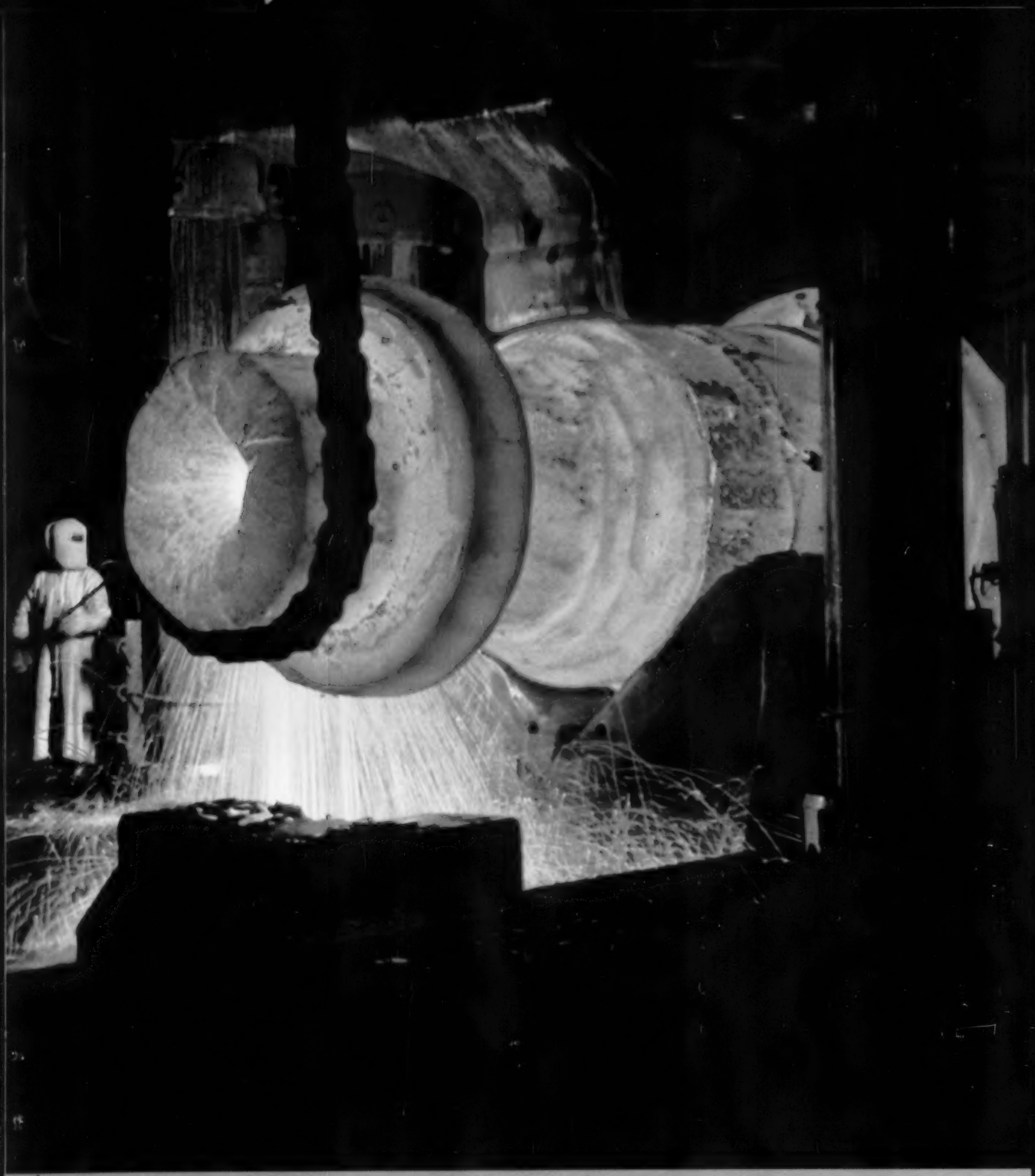
Steel Founders' Society of America—Fall meeting, Sept. 22-23, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland 13.

Air Moving & Conditioning Assn., Inc.—Annual meeting, Sept. 22-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 2159 Guardian Bldg., Detroit 26.

Porcelain Enamel Institute — Annual meeting, Sept. 25-27, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

The Electrochemical Society, Inc.—Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, New York.

Pressed Metal Institute — Annual meeting, Sept. 28-Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

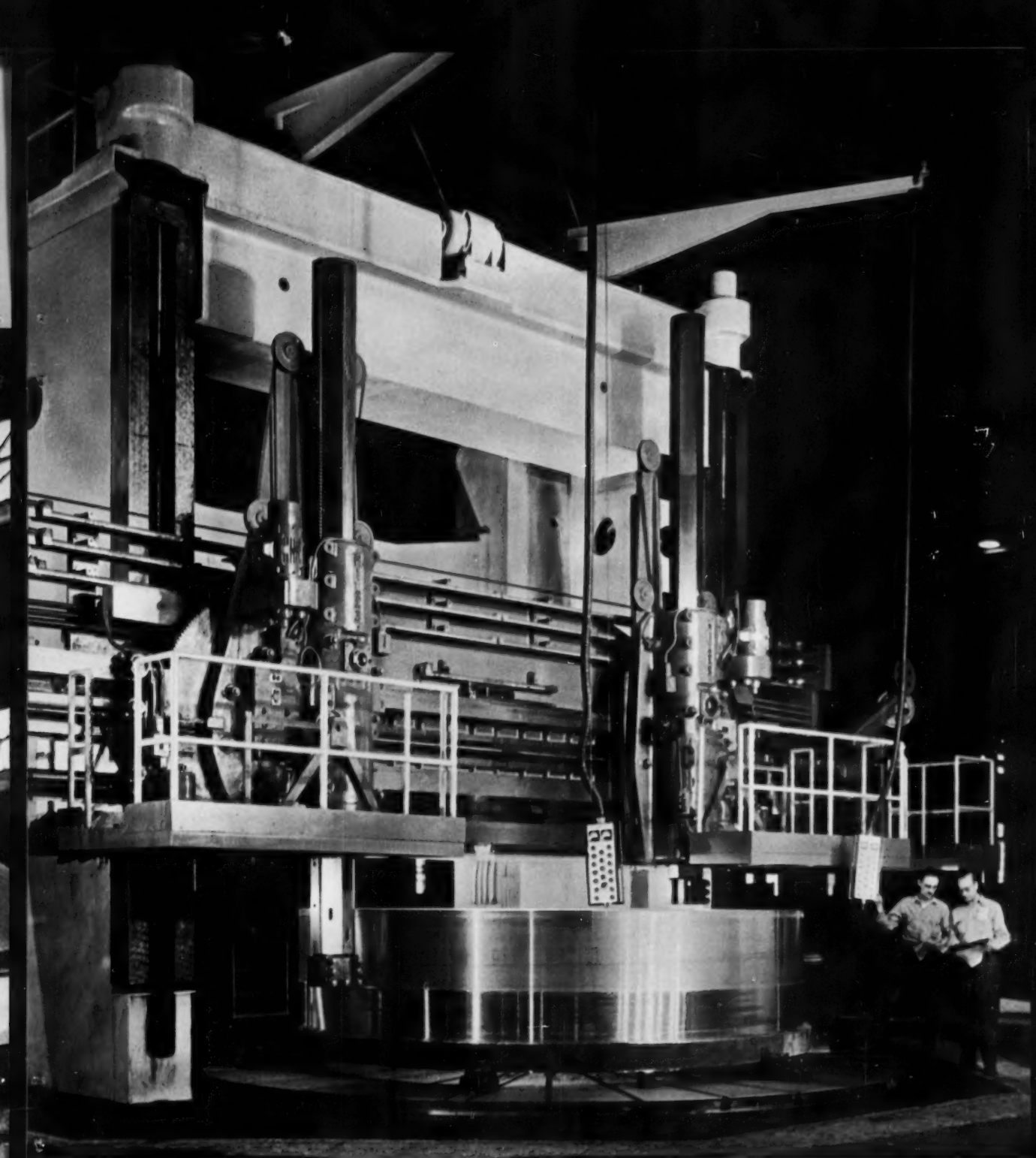


BIG SHAFT FORGING FROM BETHLEHEM

One big shaft coming up! The glowing mass of carbon-vanadium steel begins to take shape in a 7500-ton hydraulic press at the Bethlehem forge shops. The finished forging, weighing approximately 74 tons, will be part of a hydroelectric installation. Its overall length will be 26 ft 1 in.; flange diameters, 8 ft 10¼ in. and 6 ft 8¾ in.; main body diameter, 3 ft 10¼ in.; bore diameter, 1 ft 8 in.

WILL HELP CREATE POWER AT THE DALLES

Here's another huge shaft, a type you'll often see in Bethlehem's forge and machine shops. It's one of eight we made for the generating equipment at The Dalles Dam, on the Columbia River. This one weighs 95 tons; is over 33 ft long, and has a maximum diameter of 8 ft ½ in. The steel is carbon-vanadium with a tensile strength of 70,000 psi and a yield point of 35,000 psi.



NEW CAPACITY ADDED TO BETHLEHEM MACHINE SHOPS

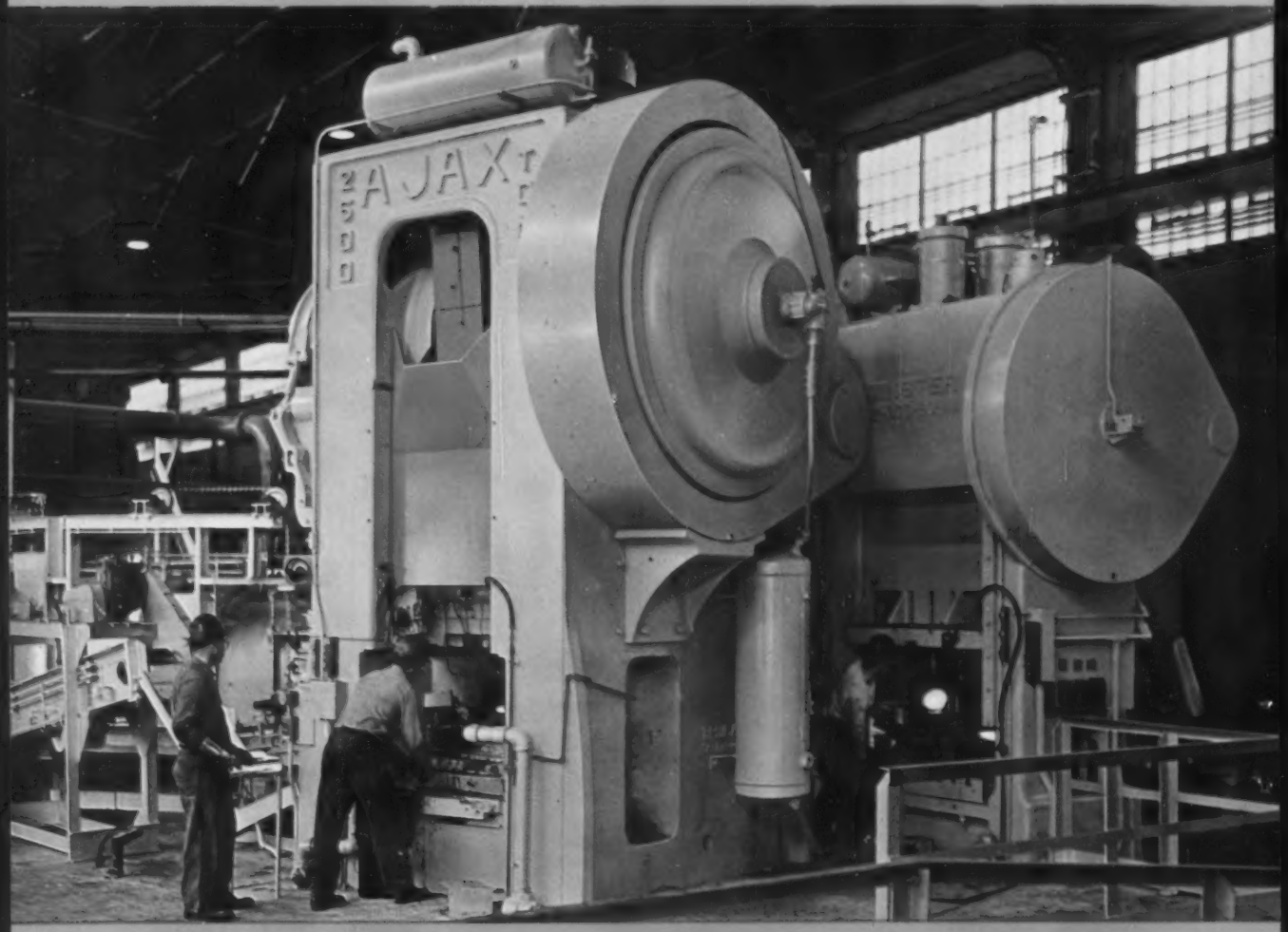
This king-size vertical boring mill is one of several machines that add new capacity to Bethlehem facilities. It has a 20-ft table, a swing of 20 ft 3 in., and a height of 11 ft 9½ in. under the tools. Thus it can handle pieces much larger than that forged gear tire. Electronically controlled, it has infinite feeds from 0.0005 in. to 1 in. per revolution; speeds from 0.34 to 18 rpm.

SMALL FORGINGS HAVE THEIR INNINGS, TOO

At the same time a big-tonnage item is being forged, treated, or machined, another part of the Bethlehem shops may be turning out small pieces weighing only a few pounds. Bethlehem produces the full range of forgings, from the largest ever needed to the smallest.

Shown here is a 2500-ton mechanical press, a power-packed machine that's as modern as today. Yet for all its size and power, it's used for making forgings under 50 lb in weight. Auxiliary equipment includes a 14-ft rotary furnace with automatic charge and discharge; the latest type of trimmer; and roller conveyors throughout the entire system. For the production of forgings used in aircraft, drilling tools, mining and earth-moving machinery, etc., this outfit is unsurpassed.

Also available at Bethlehem are steam and board drop hammers to 8,000 lb; mechanical presses to 3,000 tons; upsetters to 9 in.



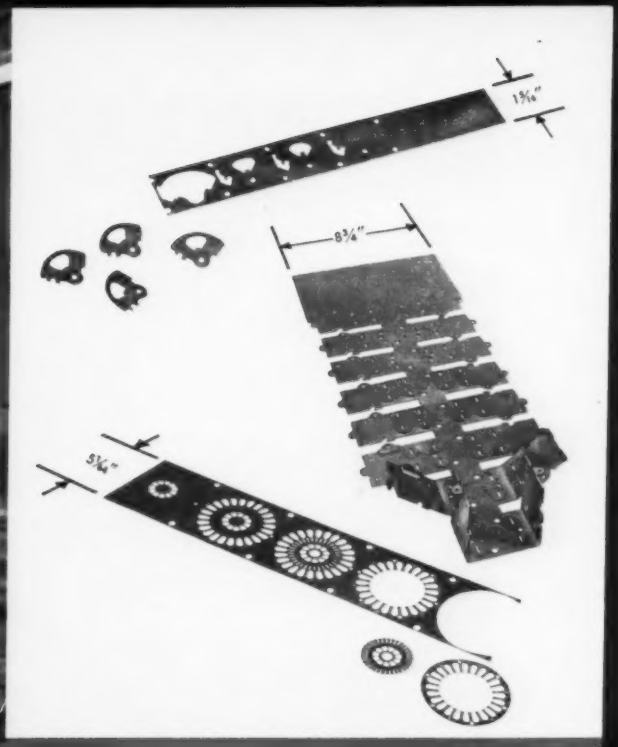
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

BETHLEHEM STEEL

BETHLEHEM STEEL

Folder 867

586, Printed in U.S.A.



GIVE YOUR COSTS A BREAK...

Run your progressive dies at their top speed in a Piece-Maker

A Minster Piece-Maker press will deliver the maximum productivity from your progressive dies. That means more profit for you.

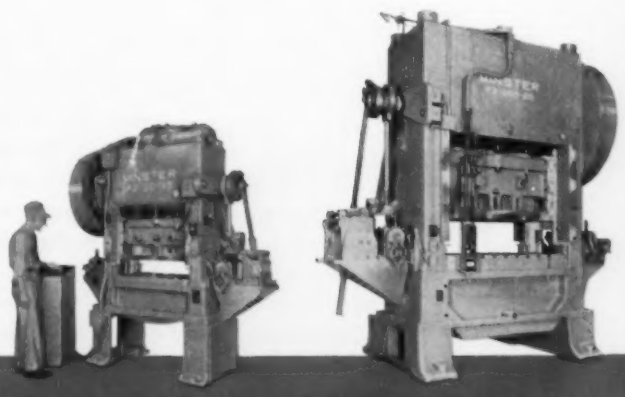
A 100 Ton Piece-Maker (like the one shown above) will run efficiently at the highest speed at which any blank, notch, pierce, draw or cut-off progressive die can be run (150 to 300 spm are not uncommon) . . . and do it with real accuracy.

The precision-built Minster Piece-Maker automatic production press has the stability to run continuously, giving you the best possible die performance and longer life for expensive progressive dies.

With a Minster you get all the economies of automatic production and, equally important, you get the experience of Minster application engineers who help you match the press to the job.

Are you taking full advantage of automatic production? Let your Minster representative tell you more about the Piece-Makers.

Two Point (P2) Capacities from 20 to 300 Tons
Single Point (P1) Capacities, 75, 100 and 150 Tons



THE MINSTER MACHINE COMPANY

MINSTER, OHIO

Photo taken at Continental Can Company's Chicago Laboratory

Republic's fabricating "Know How" helps Continental Can Company

BEAT THE HEAT AND COLD !

In a specially constructed "torture" chamber, the Continental Can Company, Chicago, exposes thousands of cans and their contents to extreme heat and cold.

The customer wanted rack-type shelving with sliding shelves that could be quickly and easily adjusted to accommodate a variety of can sizes and types, yet still weather the severe changes in temperature. Republic's Berger Division took over the problem, came up with the solution. Through its contract manufacturing facilities and equipment, Berger took the whole job off the customer's hands.

In Berger Plants many sheet steel products are fabricated for other customers and marketed under the manufacturer's brand name.

Berger's large stocks of standard tools, dies, and specialized equipment for punching, shearing, forming, welding, and Bonderizing are available to you. Constant research and development at Berger have resulted in advanced processes and equipment to make your fabricated sheet steel products more attractive, and more economical.

Men of Berger's national sales force will help work with you to solve sheet steel product problems . . . whatever your location. With Berger manufacturing, you get the sales advantage of shipment out of well-located Canton, Ohio. Republic's fabricating "know-how" provides you with the same high quality you see in Berger Division products—lockers, office furniture, shelving, and steel kitchens.

Send a sketch or blueprint with complete specifications. Berger will tell you promptly what their specialized services can do for you. Detailed information is available in Bulletin 1090.

REPUBLIC FILING CABINETS are available in a wide range of styles and sizes to meet any office filing requirement. Drawers coast on cradle-type progressive ball-bearing suspension slides. All steel construction withstands exceptionally hard use. See your dealer—or send coupon today.

SOLVE THE PROBLEM of storing heavy items with Republic Wedge-Lock Steel Shelving. It is specifically designed for high stacking of enormous weights. The joints actually get tighter as more weight is added. Wedge-Lock Steel Shelving provides maximum loading in minimum floor space. Shelves can be easily adjusted — whole units can be converted or combined to suit changing needs. It can be easily and quickly assembled. Send coupon for full information.

REPUBLIC STEEL LOCKERS are Bonderized to preserve their fine finish and protect against rust. They combine smart styling and design with simple construction, for fast, easy installation. They provide full inside locker roominess, sanitation, and safety. Send coupon for literature.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

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☐ Send Bulletin 1090 describing Berger Fabrication facilities and abilities
Please send more information on:
☐ Wedge-Lock Steel Shelving ☐ Lockers ☐ Filing Cabinets

Name_____ Title_____
Firm_____
Address_____
City_____ Zone____ State_____

JONES & LAMSON MACHINE TOOLS

the man who needs a new machine tool is already paying for it

Turret Lathe Tracing Pays off Double — and More!

It is hard to select the "best" feature of a J & L turret lathe which is equipped with a tracing unit. It could be the cost saving factor, as in the job illustrated above. Stainless steel forgings are first rough-machined with tools from the hexagon and square turret positions. Then, *in the same chucking*, the tracer is engaged and the parts are contoured to a 16 mu-in. finish at better than 1000 SFM. Manufacturing costs were cut 74%.

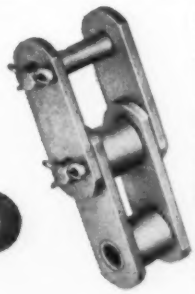
Another customer points out broader advantages. He says: "My turret lathe with its tracing attachment is the most versatile machine in my shop. It's a bar machine, a chucker, an engine lathe, and a shaft and cross-center duplicator, combined. No machine could do more, or produce more profits for me."

Write for detailed information. Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

"Full-round" design of Link-Belt LXS chain avoids stress raisers

ROLLERS are accurately machined for correct operating clearances and free-rolling action.



SIDEBARS of selected steel have accurately machined "full-round" pitch holes, which maintain firm, tight press fit of pins and bushings.

FOR POWER TRANSMISSION, LXS chain is generally supplied with offset sidebars. Uniform stress distribution provides extra chain life and safe dependable operation.

FOR CONVEYING AND ELEVATING, LXS chain with straight sidebars and rollers to meet varied operating conditions. A wide variety of attachments is available.

"FULL-ROUND" PINS are made from a tough steel, specially treated for high strength in shear . . . sized for controlled press fit to prevent rotation in sidebars.

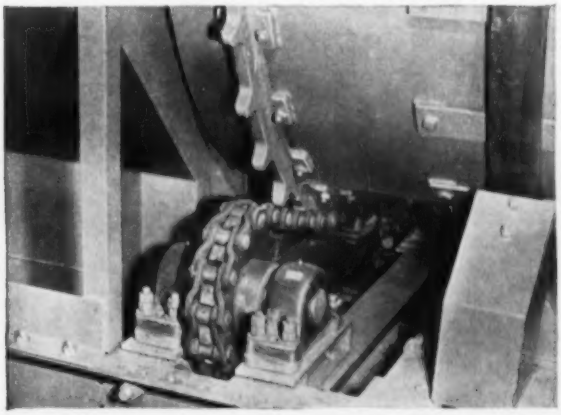
"FULL-ROUND" BUSHINGS are properly hardened to shrug off shock, resist wear . . . accurately sized for controlled press fit to prevent rotation in sidebars.

Greater live bearing area extends life

Stress concentration points are eliminated in Link-Belt LXS chain! "Full-round" design avoids sharp corners which may be the starting points of chain failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly . . . long chain life is assured under severe conditions.

Pins and bushings of LXS chain are accurately sized . . . assuring controlled press fits, preventing rotation in sidebars. Similar accuracy in machining of sidebars permits close control of pitch and proper chain length after assembly.

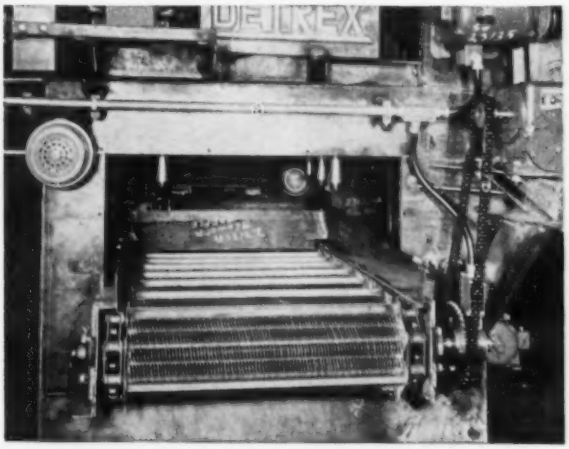
Other long-life features of Link-Belt LXS chain include use of selected steels and controlled hardening of all parts. Both contribute to greater endurance . . . greater uniformity.



LXS drives stand up to impact and abrasive service

Large, live bearing area makes LXS chain ideal for exposed drives and abrasive conditions such as found on this heavy rotating drum. Uniform distribution of load over ample bearing area reduces cutting action of abrasives . . . extends chain life.

LXS chain has stamina required for long, heavy-duty conveyors



With its exceptional strength and wear resistance, Link-Belt LXS chain can easily meet rugged conveying and elevating requirements. Due to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life necessary for the extra-long conveyors so important to today's highly mechanized industry.

HEADQUARTERS for chains, sprockets and other Link-Belt products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Refer to the Yellow Pages of your local Phone Directory.

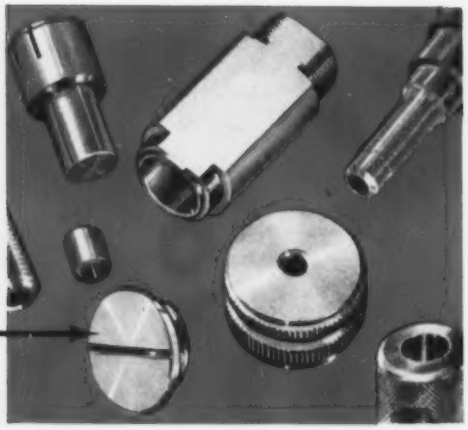
LINK-BELT

14,740

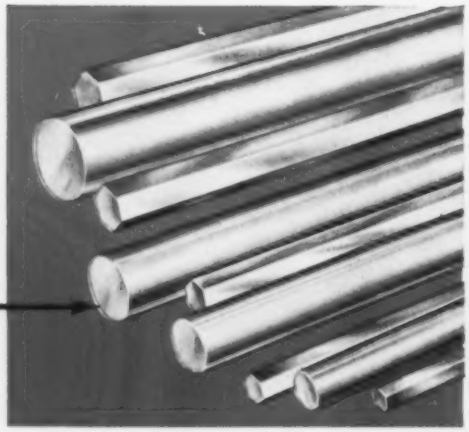
CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

If you're producing
parts like these...



And you want an
inventory of aluminum
screw machine stock...



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Reynolds Metals Company, Richmond 18, Virginia

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Made with Aluminum
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It's your move... BUT PLAY SAFE!

SELECT GARLOCK MOLDED AND EXTRUDED RUBBER PARTS FOR ASSURED QUALITY

You can be sure of consistent high quality when you specify Garlock molded and extruded rubber parts. Why? Because Garlock has broad experience in compounding natural and all synthetic rubbers including silicone. Whether your problem involves temperature extremes, difficult liquids or gases, compression set, abrasion, or tear resistance—Garlock engineers can recommend a material and design best suited for the job. Moreover, Garlock manufacturing facilities are available for large quantity production of molded and extruded parts.

Molded and Extruded Rubber Products are another important part of "the Garlock 2,000" . . . two thousand different styles of Packings, Gaskets, and Seals for every need. The only *complete* line. That's why you get unbiased recommendations from your Garlock representative. Call him today, or write for Folder AD-147.

THE GARLOCK PACKING COMPANY, Palmyra, N.Y.

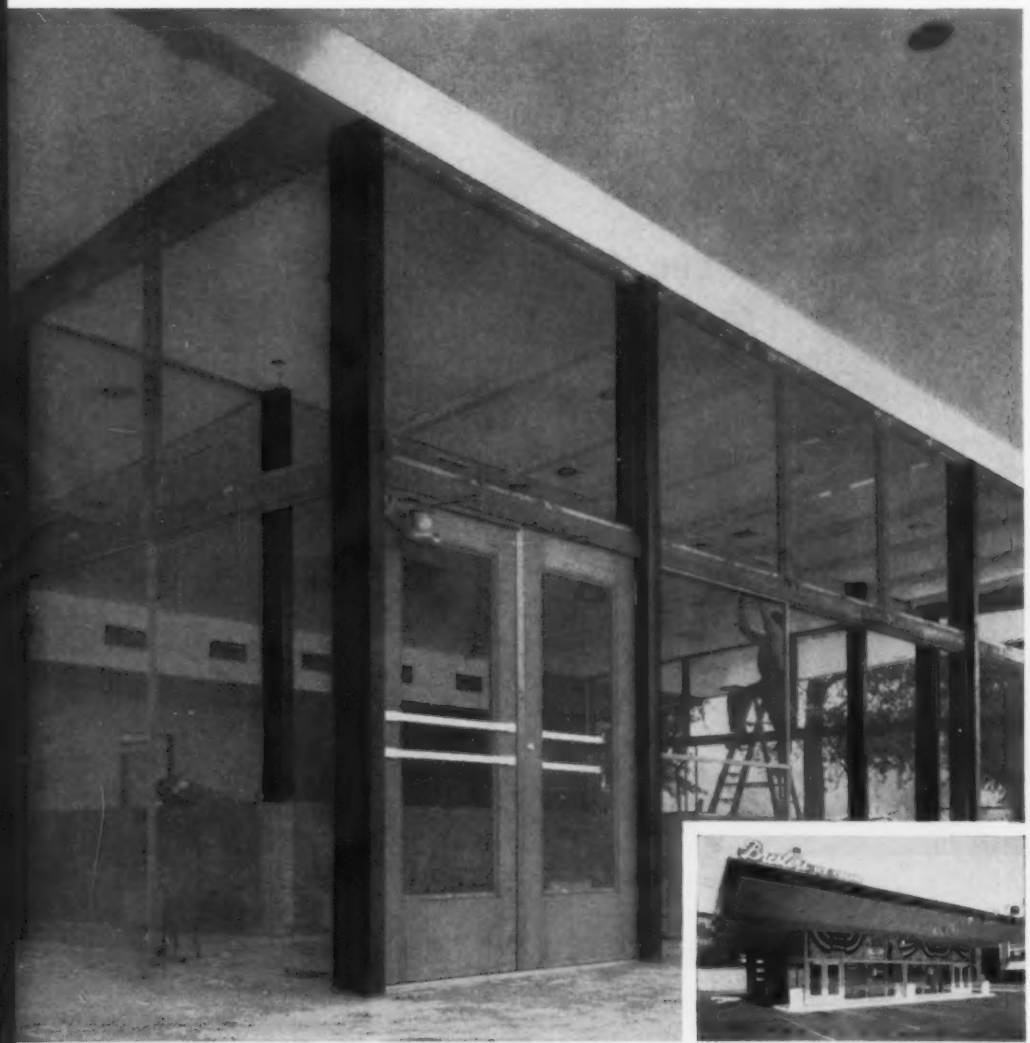
For prompt service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

How they built it better

with USS National Seamless



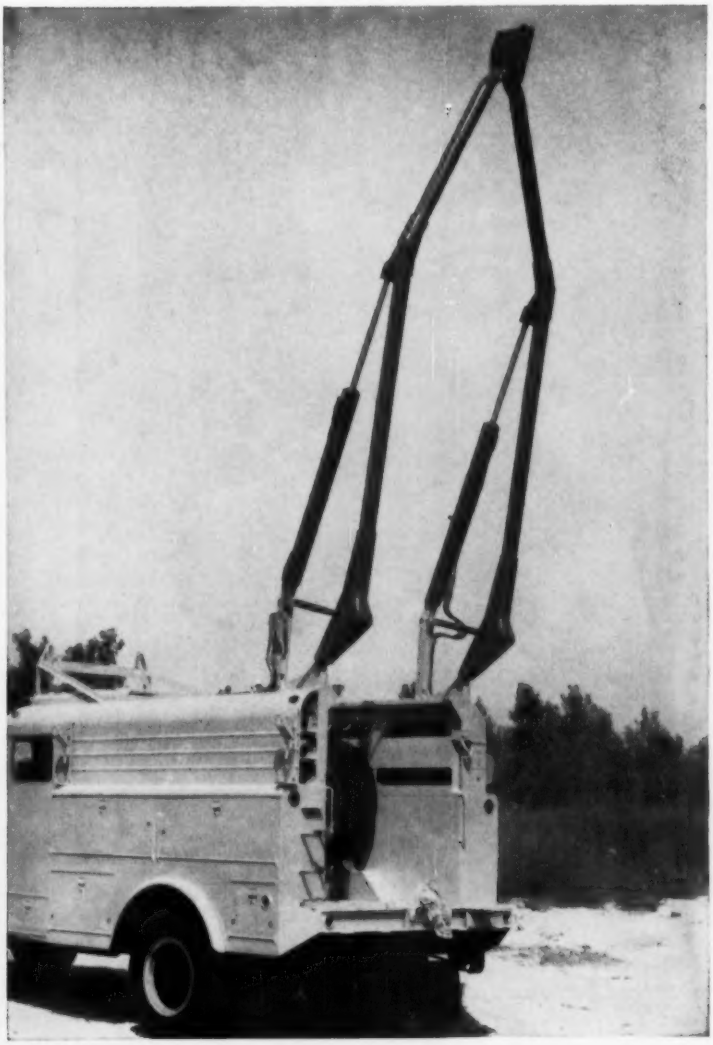
Drive-In Restaurant. This is one of a chain of Henry's self-service restaurants in the Chicago area. Built of steel, glass, tile and concrete, all of these buildings are identical in design. The unique feature is that every vertical supporting column in these buildings is fabricated* from sections of 4″ x 8″ Shelby Seamless Rectangular Steel Tubing. Four tons of this ¼″ wall tubing were used in each restaurant. These columns of Shelby Seamless Tubing cost considerably less than did the previous method of forming and longitudinally welding squares and rectangular columns to specifications. Moreover, they are consistent in quality and strength, and provide a handsome, uniform appearance.

**Fabricator's name on request.*

National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors · United States Steel Supply Division
United States Steel Export Company, New York

Pipe and Tubes



"Pole-Master"* Hydraulic Derrick. The powerful, two-legged boom of this hydraulic derrick is made of USS Shelby Seamless Mechanical Steel Tubing. The great strength, lightness, and shock absorbency of Shelby Seamless enables it to handle poles up to 75 feet in length with relative ease. The boom is activated by two hydraulic cylinders, also made of Shelby Seamless Tubing, which are powered by a heavy-duty hydraulic pump. Operating arc of the derrick is more than 180 degrees. It is designed to "set" or "pull" poles from the ground.

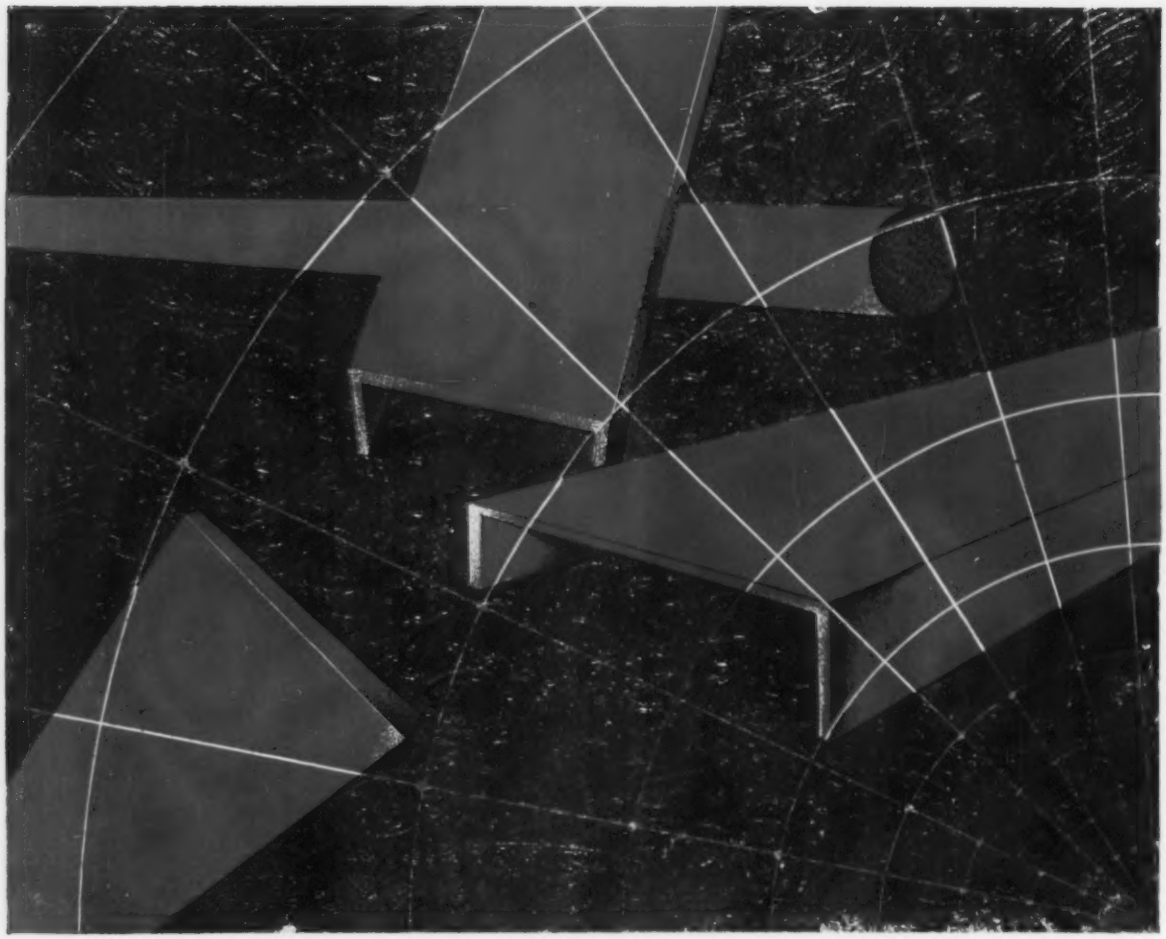
**Manufacturer's name on request.*

Photo: Courtesy Combustion Engineering, Inc.

Giant Superheater Coils. This king-size superheater coil being hoisted into position is only a small portion of the total USS National Seamless Steel Tubing installed recently in a huge modern boiler. Actually, *49 miles* of National Seamless Tubing were used. Here, steam at more than 2000 psi is superheated to 1000°F. In spite of this severe duty, it poses no problem for National Seamless, which is, in fact, built to withstand much higher pressures and temperatures. National Seamless Tubes have the strength, uniformity and dependability of solid forgings.

Perhaps USS National Seamless Pipe and Tubes are just the materials you've been looking for to cut costs, lighten weight, increase strength, shock-absorbency and workability in your product. Why not get in touch with us and find out? Write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. Or, for Shelby Seamless Tubing, contact your nearest Shelby Distributor.

USS, National, and Shelby are registered trademarks



Use quality USS Stainless Steels

...available at your steel service center

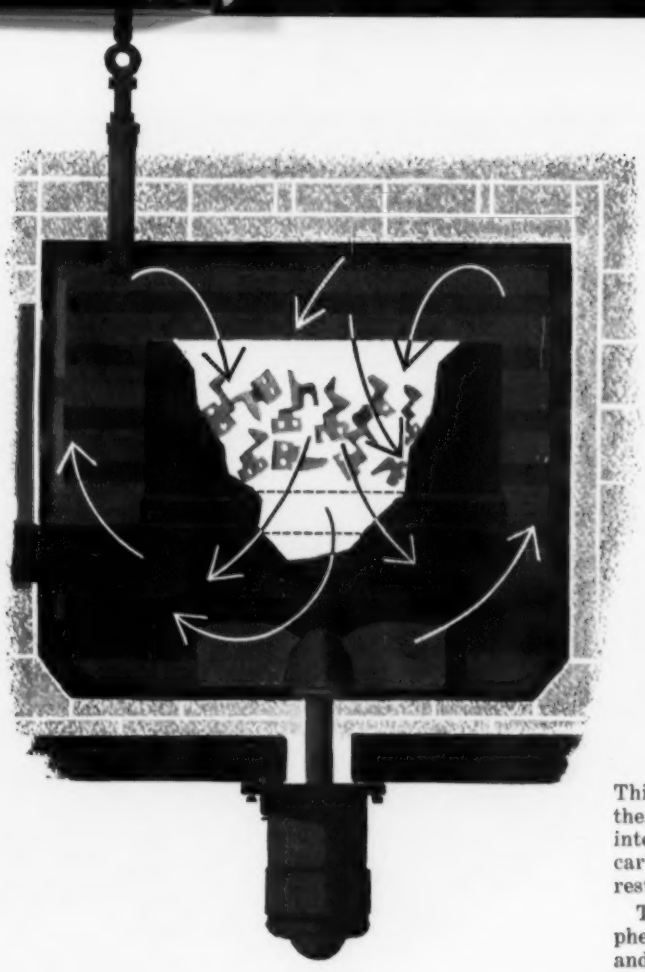
By ordering USS Stainless Steels from a steel service center, you can avoid costly idle inventory and get delivery of the material you want . . . when you want it.

Here's your opportunity to combine the money-saving benefits of a steel service center with the fine, quality-controlled products of United States Steel. USS Stainless Steels are available right now, because of their strategically planned, wide distribution.

Remember, as a part of the American SteelWarehouse Association, your steel service center has been set up specifically to handle your immediate steel demands. So the next time you order stainless from your steel service center, be sure to specify *USS Stainless Steel.*

USS TRADEMARK **United States Steel**

AMERICAN STEEL WAREHOUSE ASS'N.



it's new!

The L&N Tricarb method with controlled atmosphere . . . temperature . . . quench

This precision furnace is the most versatile in the history of heat treating. It can be used interchangeably for controlled case carburizing, carbonitriding, homogeneous carburizing, carbon restoration, or hardening.

The unique combination of Microcarb atmosphere control, Speedomax® temperature control and the controlled quench, makes possible significant quality improvements in production heat treating. New, efficient, L-O voltage radiant tube heaters are rugged, requiring minimum maintenance—are not subject to failures from carbon deposits when the furnace is used for carbonitriding without Microcarb control.

In many instances the Tricarb method has proved a practical solution to lower production costs . . . higher quality . . . more process automation . . . elimination of rejects and spoilage. In others it makes thoroughly practical the handling of many previously impossible or difficult heat treatments on a reproducible, production basis.

Folder T-620(17) explains the Tricarb Method. Write us at 4956 Stenton Ave., Phila. 44, Pa.

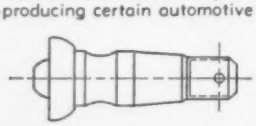
When small cams for electrical instruments are carburized in this Tricarb furnace, 6¢ per piece is saved on subsequent buffing operations because work comes from the furnace so clean.

LEEDS & NORTHRUP
Instruments · Automatic Controls · Furnaces

LANDIS *"Automatic"* PROVED BY PRODUCTION . . . .

Points and Threads 1020 Ball Studs per hour

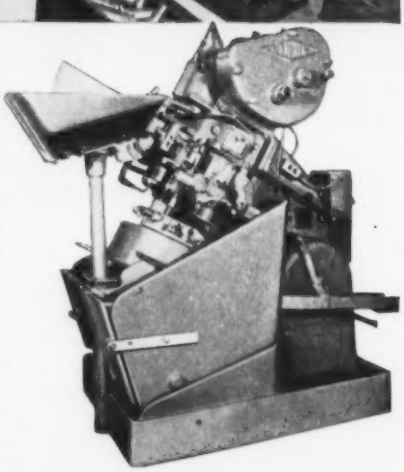
Through the use of LANDIS Automatic Forming and Threading Machines, a large manufacturer has solved his problem of mass-producing certain automotive parts.



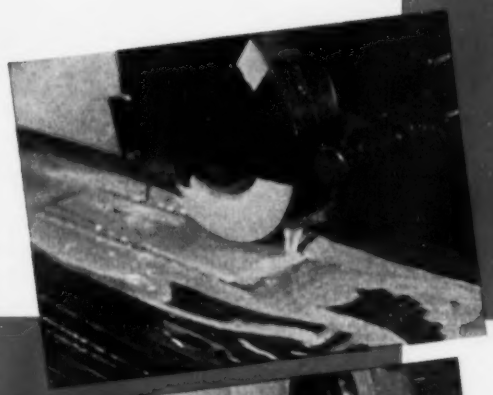
The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16" 18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down time.

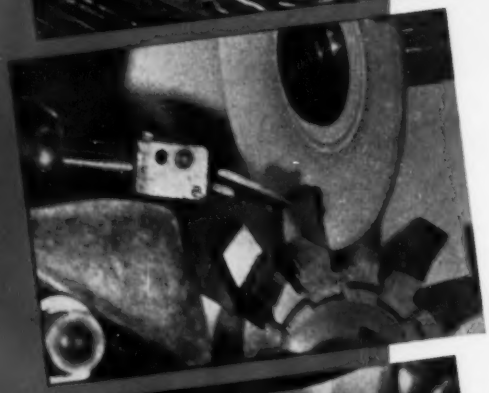
Because of their universal features, LANDIS Automatic Forming and Threading Machines are adaptable to mass-production operations on a wide range of automotive parts. By means of pick-off speed change gears, the machine cycle can be varied to accommodate any combination of thread length, pitch, and thread diameter, within the capacity of the machine—therefore this machine is adaptable to a wide variety of work. Hopper feed and automatic operation throughout enable one operator to keep a battery of machines in constant production, while set-up changes of all types can be made in minimum time.

Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA





SIMONDS ABRASIVE CO.

NEW SA Borolon® TRADE MARK GRINDING WHEELS

"WE LIKE THEIR COOL CUTTING ACTION"

"CORNERS HOLD UP WELL"

"NO OTHER WHEELS RUN SO TRUE"

Superior grinding! That's the theme of these unsolicited quotes from users of Simonds SA Borolon wheels—and an indication of the efficient job these wheels are doing in toolrooms throughout industry. Their superiority is due to the single, uncrushed crystal formation of SA Borolon — enabling this unique aluminum oxide abrasive to present an uninterrupted sequence of sharp cutting edges, free from stress.

That is why these wheels provide faster grinding with heavier cuts—plus cool free action that protects expensive steels and prolongs useful tool life. For superior results use SA Borolon wheels on your grinders.

Send for bulletin ESA 272 for details, together with grain and grade specifications.

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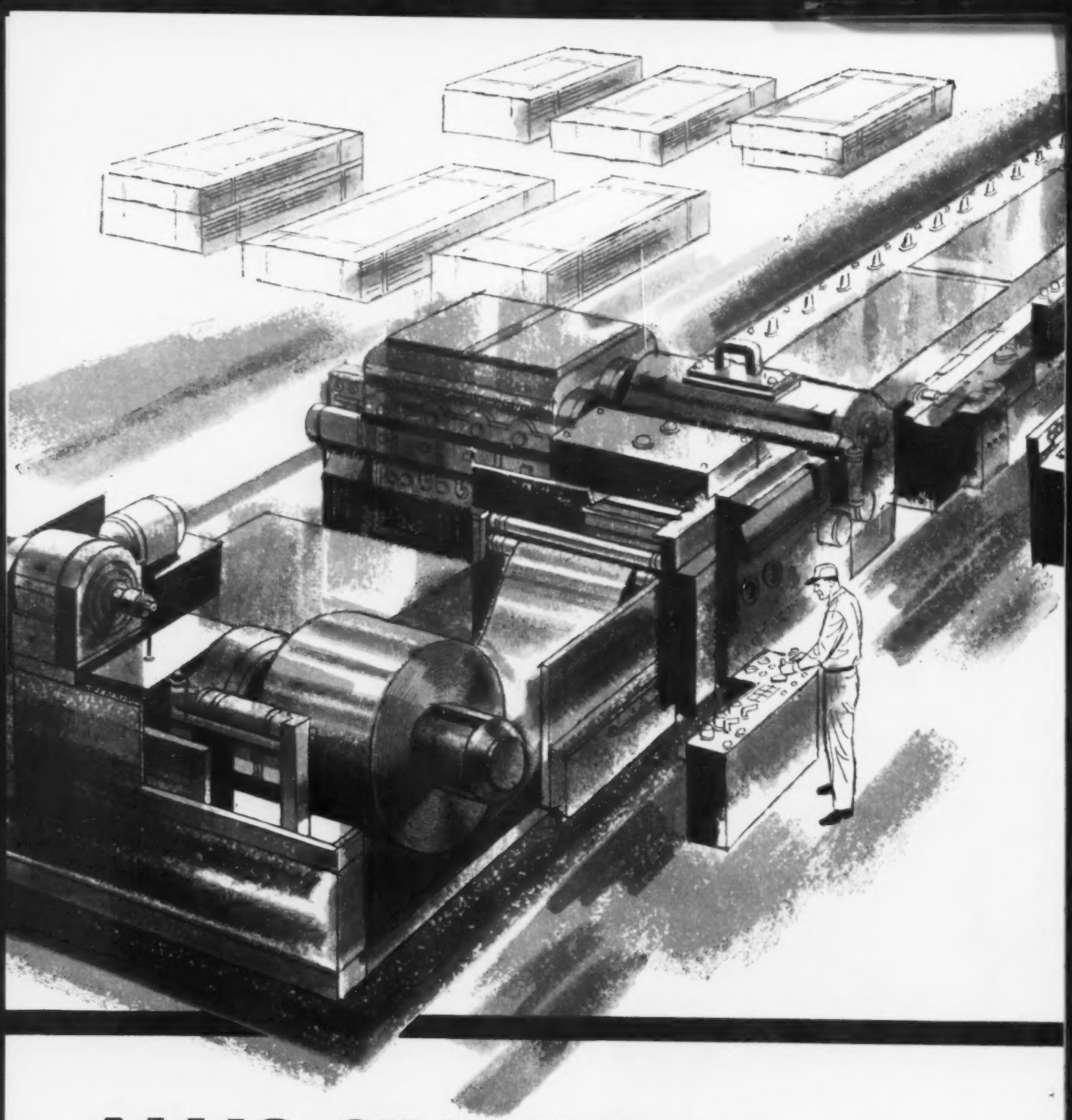
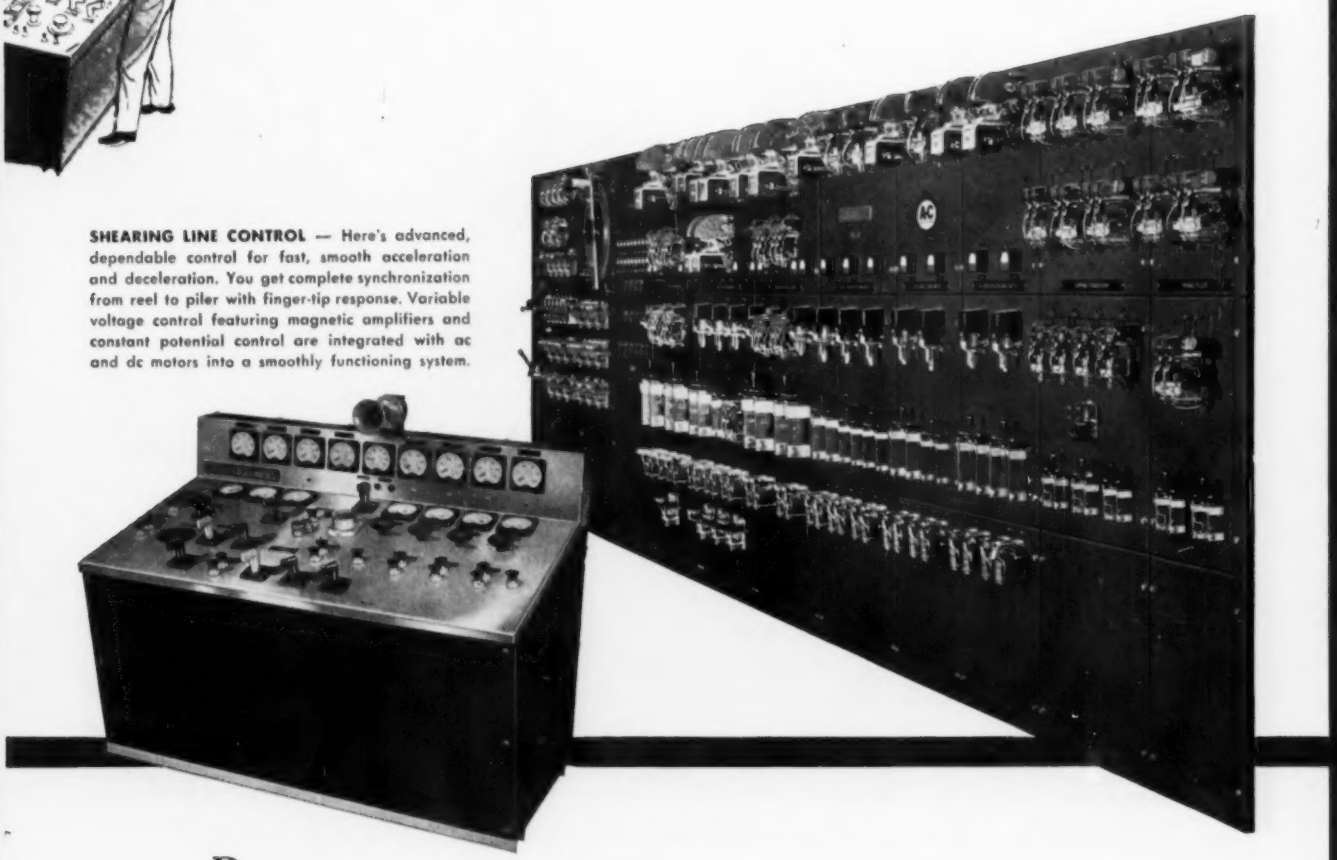


ALLIS-CHALMERS

CONTROL...

from furnace to finish

Advanced, Coordinated Control for your Shearing Line



SHEARING LINE CONTROL — Here's advanced, dependable control for fast, smooth acceleration and deceleration. You get complete synchronization from reel to piler with finger-tip response. Variable voltage control featuring magnetic amplifiers and constant potential control are integrated with ac and dc motors into a smoothly functioning system.

Regardless of your needs, you can get control equipment from Allis-Chalmers designed to meet your specific application. Allis-Chalmers builds control not only for rough, tough furnace and main mill applications, but control to provide the precise coordination required for processing lines and also equipment for accurate regulation and exacting performance of finishing mills.

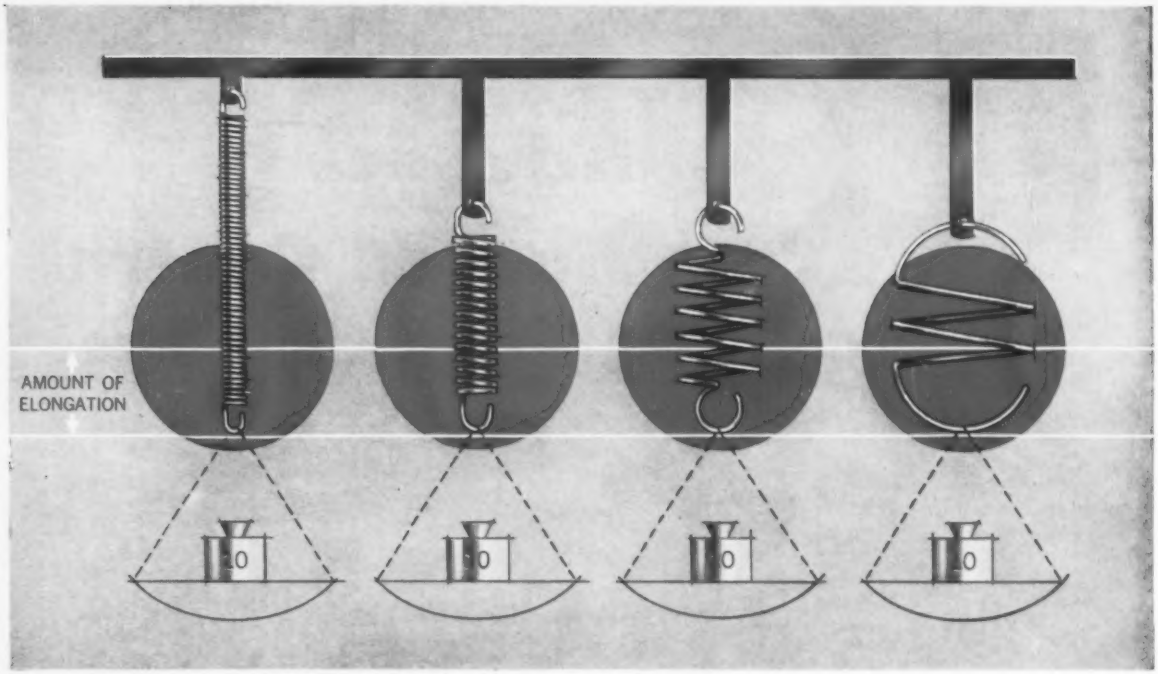
Special study is given to each application so that control components are properly integrated to provide maximum output with minimum downtime. In addition, Allis-Chalmers has the specialized knowledge to coordinate control throughout your entire mill.

If you want to learn more about control designed to meet your specific mill requirements, call your nearest A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5513



Spring shape and performance— or what does Spring Index mean?

One man distributes his 150 lbs. over a lean 6 ft. frame; another packs the same avoirdupois within a stocky 5 ft. 6 in. height. In a man, this might be expressed as the ratio of height to belt size. In a spring, it's a handy little ratio D/d, that of mean coil diameter to wire diameter. The illustration shows it quickly—same load—10 lbs.; same deflection—0.4 in. But in shape they range from the long thin spring at left with 75.8 coils and a spring index of 3, to the short fat spring at right with few coils and an index of 12. Application of the index ratio is particularly useful where space restrictions exist.

Our long years of specialization have developed many short cuts to spring specification to make your work easier. For general reference purposes write for pamphlet "Spring Design and Selection in Brief."

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Chicago 14, Ill.
Milwaukee Division, Milwaukee, Wis.
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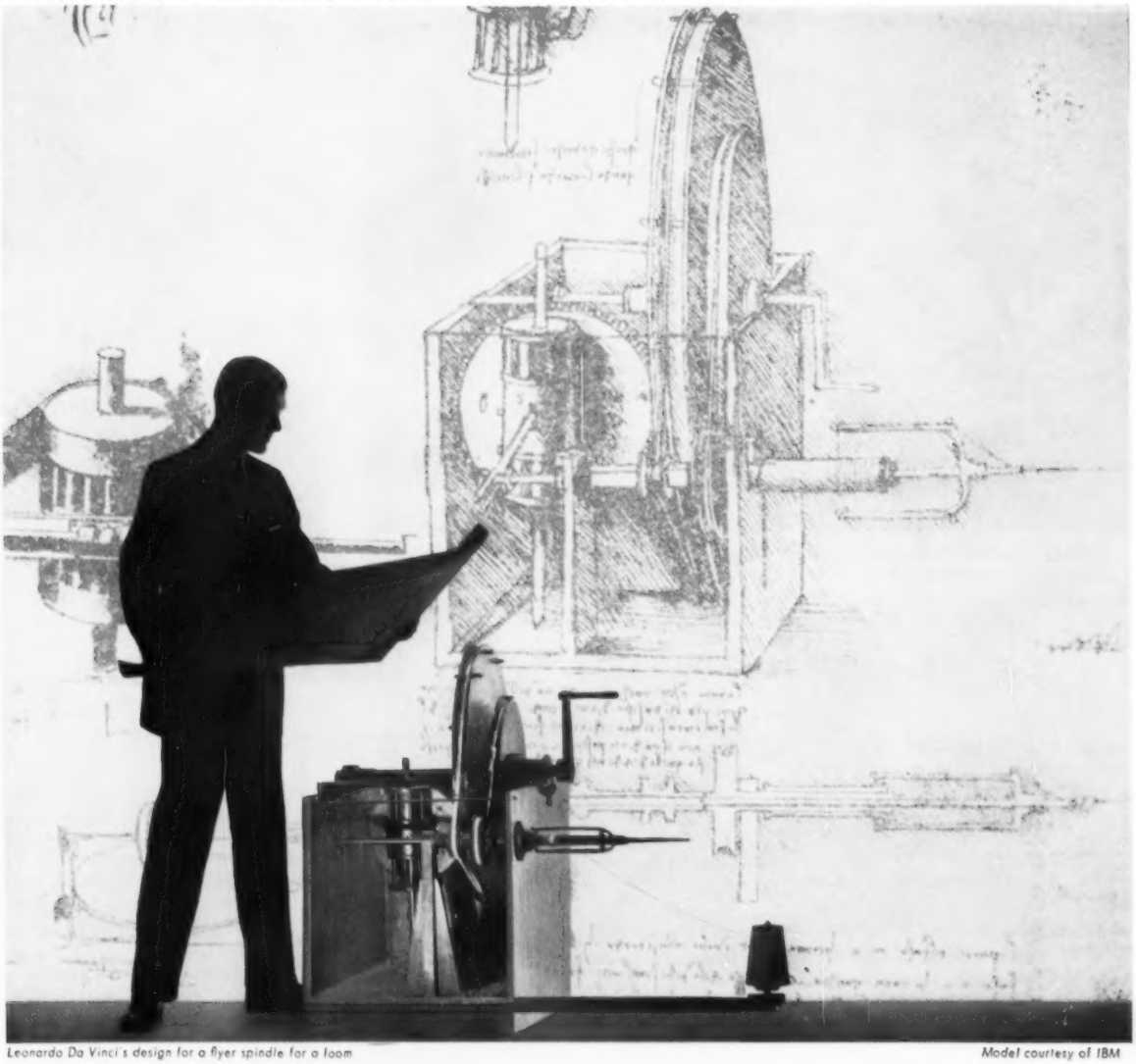
9810

creative designing calls for an open mind



Leonardo Da Vinci's design for a flyer spindle for a loom *Model courtesy of IBM*

EVEN DA VINCI'S DESIGN COULD HAVE BEEN BETTER WITH HELP FROM AN SKF ENGINEER—An SKF engineer never has to push one bearing over another, because SKF makes all four types of ball and roller bearings in over 3,000 sizes. This gives every SKF engineer the kind of flexibility he needs to keep an open mind on *any* bearing problem. Give your problem to SKF and see.

7812

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U.S. PAT. OFF.

Copper-Coated Strip, shown before heat-treat at Victor Adding Machine, prevents distortion of precision parts during case hardening of working surfaces.

Plain Steel number dials are welded to precision-made Thomas Strip.

Victor Adding Machine, Others Cut Costs, Improve Products With Thomas Strip

Manufacturers across the country are reporting new cost-cutting, quality-boosting results from their use of Thomas Strip's cold-rolled specialty steels.

At Victor Adding Machine Company, Chicago, for example, copper-coated Thomas Strip slashed one major production cost by 50% and made big savings in another operation.

Fred E. Rolli, Victor's chief engineer, says Thomas Strip is "the greatest single improvement in our production process in the past 10 years."

Here's why:

Victor's deluxe Model 75 contains 2500 individual parts, 68 of the most critical being made from Thomas Strip, both plain and copper-coated.

• **Distortion-Free.** Load-bearing parts—with tolerances under .001 inch, plus or minus, have to be case hardened along their sheared edges. Heat-treating plain steel (15 minutes at 1450 degrees) can warp the stamping. Often the expensive straightening process caused tiny surface cracks which elongated the part past the .001-inch tolerance.

To solve this problem, Victor turned to copper-coated Thomas Strip. Since the electrolytic layer of copper stops off or blocks carburizing gases, flat surfaces of the stamped part are protected. Then, plain steel edges case harden properly. The part retains flatness and proper ductility. Since there is no distortion, piece straightening of copper-coated parts is eliminated. This accounts for the 50% reduction of the total straightening operation at Victor.

• **More Savings.** A second economy begins in the punch press. Die-life is a vital factor of production costs. Like other users of copper-coated Thomas Strip, Victor finds die-life between grindings is extended as much as 33%. This is due to the lubrication effect of the copper coating.

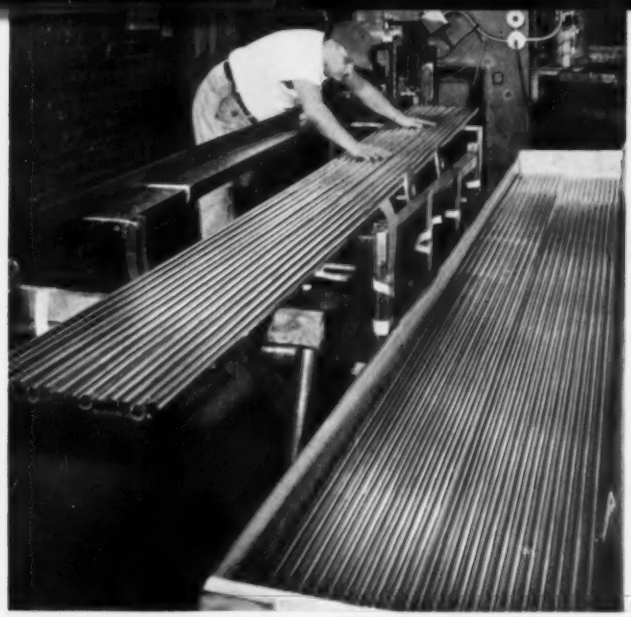
A third benefit: uniform temper and on-spec composition of Thomas Strip mean clean, burr-free sheared edges. Burrs, like slivers, are banes of close-tolerance operation of machine parts.

• **Satisfied.** Engineer Rolli sums it up by saying:

"Elimination of straightening is one of the biggest boons to small parts manufacturers that I've seen in the business. Even if Thomas Strip had no other benefits than eliminating a production problem, using copper-coated strip would be entirely worthwhile."

Thomas Strip's advantages are the same throughout industry. Other examples of how manufacturers cut costs, improve products—get higher profits and increase sales are shown here.

Thomas Strip's newly expanded and diversified production facilities give you the full range of products on these pages, in addition to zinc and chrome coatings . . . or hot-dip coated with lead alloy or tin. Uncoated Thomas Strip products include low carbon, alloy and high carbon spring steel grades.



Steel's Strength, Brass' Beauty are combined economically to form lock-joint tubing at Van Huffel Tube Corp., Warren, Ohio. Largest producer of rolled shapes in the nation, Van Huffel uses clear-lacquered, brass-coated Thomas Strip to make tubing for variety of products, including curtain rods and lamps. Thomas' brass and lacquer coatings easily withstand forming pressures and resist roll damage to the finish. Tubes usually need no further surface finishing. Van Huffel has been a satisfied Thomas Strip user for 26 years.

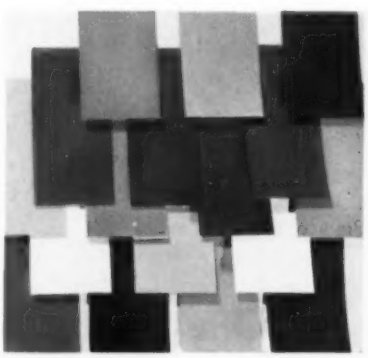
Capacity Up 25%, Sales Up 45% since Automatic Wire Goods Manufacturing Co., Bronx, New York, started using Thomas' nickel-plated strip 5 years ago. President Irving Spiegel says Thomas Strip boosted quality, kept production costs constant, improved appearance and design of his extensive Jewel and Automatic kitchen utensil lines. Thomas nickel-coated strip assures a mirror-like finish, an important feature of sales appeal in the highly competitive utensil field.

All Thomas Strip products can save you money and enhance your product in six important ways:

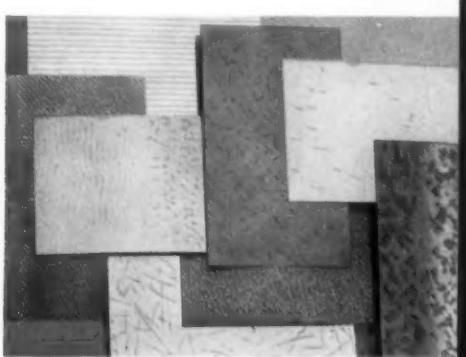
- **Fabricates Easily.** Coated steels stand fully as much fabrication as uncoated strip.
- **Longer Die Life.** Most coatings lubricate dies, reduce wear and increase tool life.
- **Maximum Pieces Per Pound.** Precision rolling to extremely close size tolerances gives more square feet of strip per ton.
- **Lower Plating Costs.** Coatings serve as final product finish or as base for further plating or painting.
- **Speeds Fabrication.** Thomas Strip coatings eliminate costly intermediate fabricating steps such as cleaning, buffing, even plating.
- **Steel's Strength and Economy** are combined with beauty and utility of more expensive metals.

All the savings and benefits Thomas Strip specialties are giving to fabricators shown here are available to you. A national sales staff—familiar with design and fabrication advantages of Thomas Strip is ready to serve you.

Write for samples, and additional cases of users' actual experiences with Thomas Strip products. Do it today!



The Rainbow's Range of colors, lacquered or painted on precision cold-rolled strip will solve your decorative and design problems. Thomas Strip's new lacquer line is the industry's finest. It's capable of wider widths in a fuller range of colors, especially pastel shades. Besides appearance, lacquer-coated steel is rugged and can be readily formed or mildly drawn without damage to the product's finish.



Unlimited Design opportunities come with pattern-rolled strip. New facilities enable Thomas to offer wider widths of any design and coating, including clear or colored lacquer. Users agree pattern-design enhances product sales appeal, permits production economies by eliminating piece buffing and costly further finishes. Pattern-designs stand up under tough forming operations and still offer attractive, flaw-free surfaces.

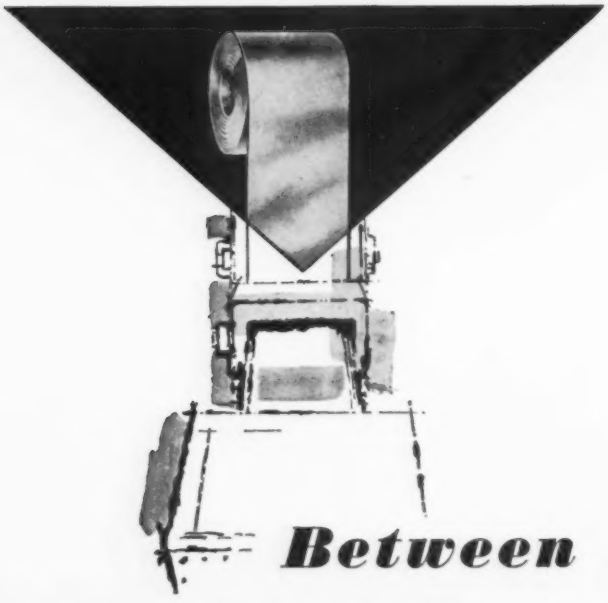
Thomas Strip® Division

Pittsburgh Steel Company

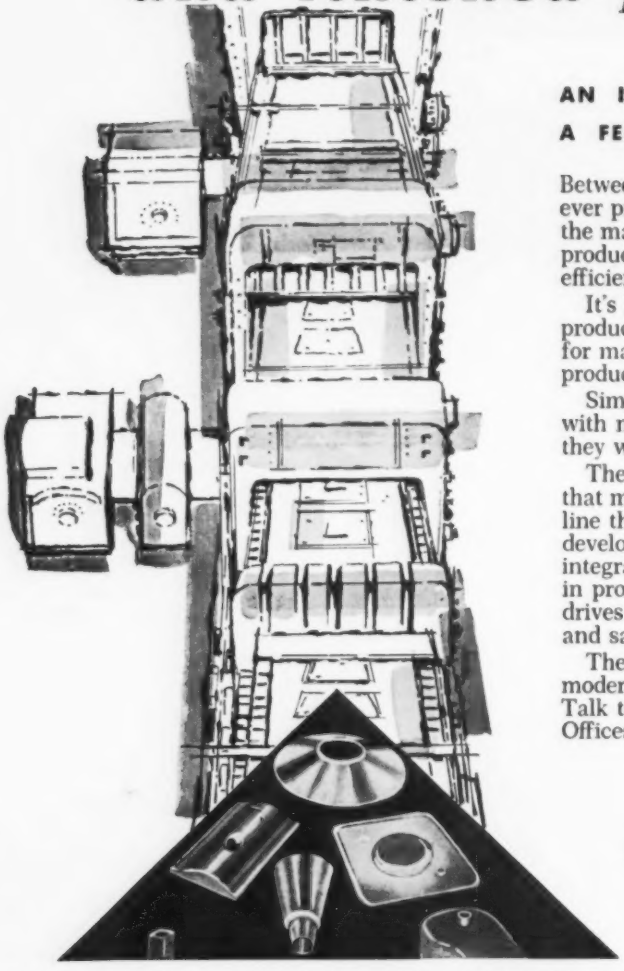
Grant Building · Pittsburgh 30, Pennsylvania

District Sales Offices:

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio



Between material and finished part . . .



AN IDEA THAT MAKES SENSE —
A FEDERAL-WARCO PRODUCTION LINE

Between material and finished part is the ever present problem of bringing together the machinery necessary to perform all production on operations as speedily and efficiently as possible.

It's here, the Federal-Warco, this packaged production line has proved to be the answer for many of the nation's foremost production experts.

Simply provide Federal-Warco engineers with material and part information and they will develop a line to do the job.

The advantages: One source responsibility that means faster, more thorough service; a line that is 100% harmonic, all stations developed especially to work in synchronization; integrated and automated handling of work in process; the possibility of utilizing common drives and bases, reducing operating costs and saving valuable floor space.

There is much more. Why not look into this modern method of production line manufacture? Talk to your Federal-Warco representative. Offices in all leading industrial areas.

Federal / Warco
PACKAGED
PRODUCTION LINES

THE FEDERAL MACHINE AND WELDER COMPANY • WARREN, OHIO

people
buy
Scott Wipers
for
many
reasons:

Mr. Swenson reports: "Prat-Daniel uses Scott Wipers for wiping bearings and shafts in the balancing department; for wiping steel plate prior to layout and processing; for wiping up oil and grease; for cleaning welders' face masks, and many other tough jobs."

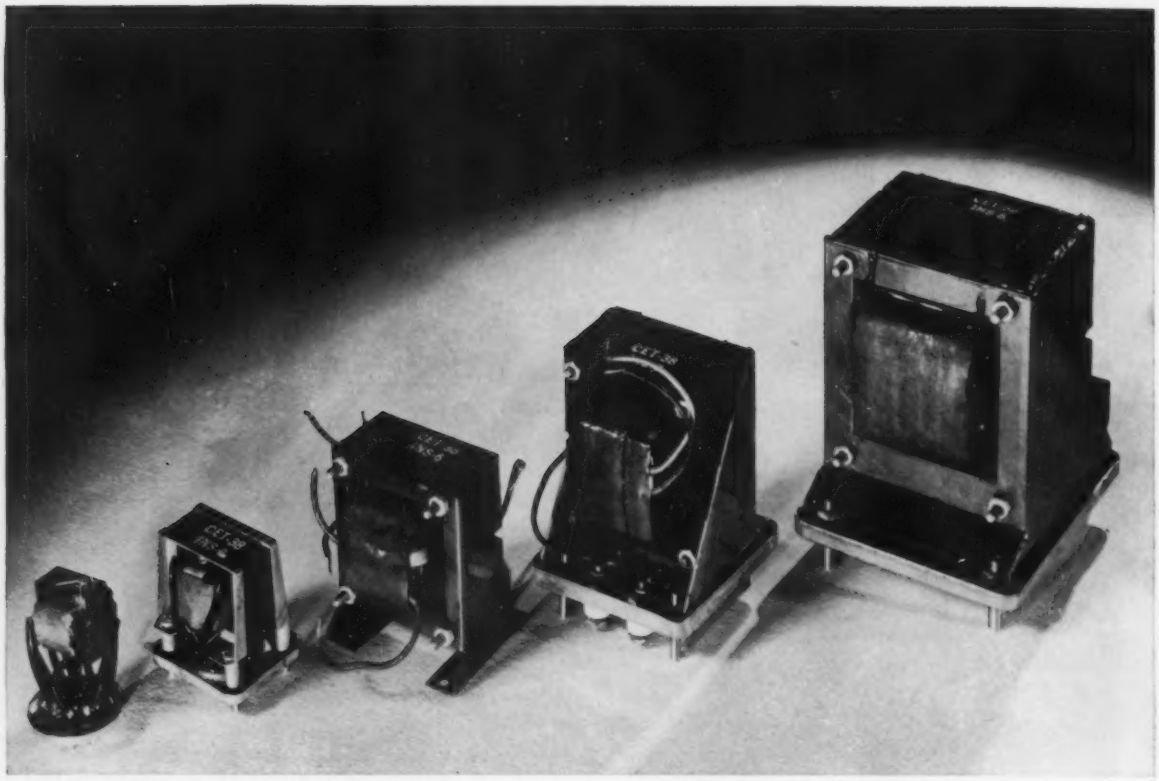
Prat-Daniel says: "We save 40% annually with Scott Wipers... and eliminated a fire hazard!"

The Prat-Daniel Corporation, South Norwalk, Connecticut, makes fan-stacks, fans, tubular and spiral dust collectors. Mr. Inge Swenson, General Superintendent, tells us: "We used waste before, and employees got the habit of letting oil-soaked heaps of waste accumulate. Now we dispose of Scott Wipers daily." As Mr. Swenson says, much work here is of a dirty, grimy nature, and employees like soft, absorbent Scott Wipers fresh from the box each time for wiping hands and face. Scott Wipers were first tested for 2 months in the bearings department —considered the toughest test—and their success here led to use throughout the plant. Annual savings: 40%.

SCOTT PAPER

Get the Prat-Daniel case history and others, covering many fields, from your Scott distributor (Yellow Pages: "Paper Towels"). Or write: Scott Paper Company, Department IA-86, Chester, Pa.

Maker of the famous Scott paper products you use in your home.
See "Father Knows Best" on NBC-TV.



A Transformer becomes a precision device with Allegheny Magnetic Materials in the core

Write for your Copy

"TRANSFORMER LAMINATIONS"

84 pages of valuable technical data on standard and custom-made laminations from all grades of Allegheny Ludlum magnetic core materials. Prepared from carefully checked and certified laboratory and service tests—includes standard dimensions, specifications, weights, etc. Sent free on request . . . ask for your copy.

ADDRESS DEPT. A-6

★ **ALLEGHENY SILICON STEEL**

★ **ALLEGHENY 4750**

★ **ALLEGHENY MUMETAL**

The operation of a transformer is no better than the magnetic core around which it is built. With Allegheny magnetic materials in the core, you get the *best*—uniformly and consistently.

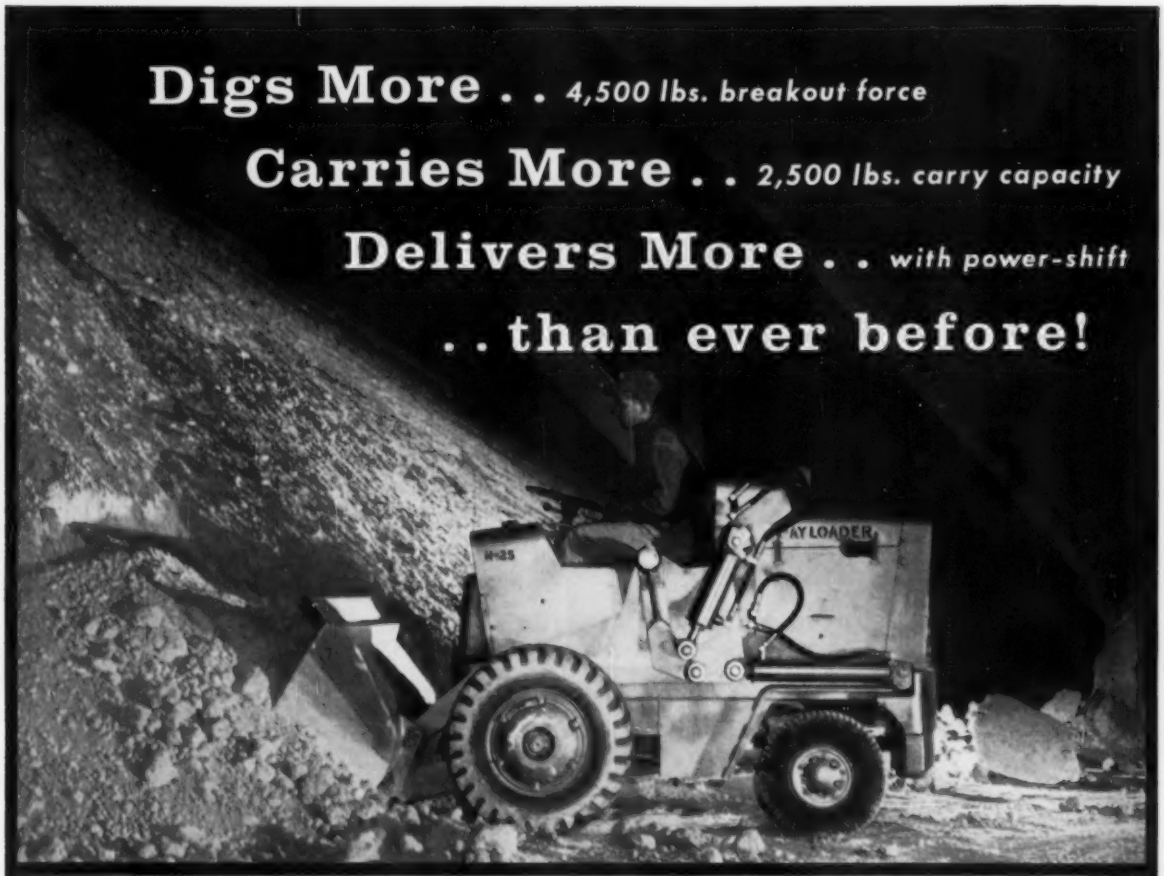
Sure there are reasons why! For one thing, there's the long experience of a pioneer in development and quality control of electrical alloys. But most important, the A-L line offers complete coverage of any requirement you may have, any service specification. It includes all grades of silicon steel sheets or coil strip, as well as Allegheny Silectron (grain-oriented silicon steel), and a wide selection of special high-permeability alloys such as Allegheny 4750, Mumetal, etc.

In addition, our service on magnetic materials includes complete lamination fabrication and heat treatment facilities. What's more, this extensive experience in our own lamination stamping department is a bonus value for all users of A-L electrical sheets or strip. ● Let us supply *your* needs. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

STEELMAKERS to the Electrical Industry

Allegheny Ludlum

AL
STEELS FOR THE ELECTRONIC AGE


Digs More . . 4,500 lbs. breakout force
Carries More . . 2,500 lbs. carry capacity
Delivers More . . with power-shift
. . than ever before!
H-25
PAYLOADER

All-New H-25 PAYLOADER®

The most important fact about this outstanding new machine is that it will handle more material per hour and at less cost per ton than any front-end loader anywhere near its size.

It has a carry capacity of 2,500 lbs. with a wide range of operating speeds, yet it goes in and out of boxcars with 6-ft. doors to load or unload them.

The two-speed full-reversing power-shift transmission with torque converter and its power steering are big reasons why it can produce all-out all day without operator fatigue.

There are many other features that put the H-25 in a class by itself . . . in productivity, ease of operation and low maintenance. A variety of attachments, quickly interchangeable with the bucket, are also available to handle many other materials besides bulk loads.

Your Hough Distributor is ready to show you that the H-25 can dig more, carry more and deliver more bulk than you ever saw this size of machine handle before.

Modern Materials Handling Equipment

THE FRANK G. HOUGH CO.

LIBERTYVILLE, ILLINOIS

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

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PURCHASE AND **HOUGH** LEASE PLANS

Now your Hough Distributer has at his disposal the broadest and most complete set of financing plans ever offered: — TIME PAYMENT . . . LEASING PLANS, with or without OPTION TO PURCHASE — any and all kinds of financing to best fit your needs.

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733 Sunnyside Ave., Libertyville, Ill.

Send complete data on the outstanding new model H-25 "PAYLOADER".

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Company _____

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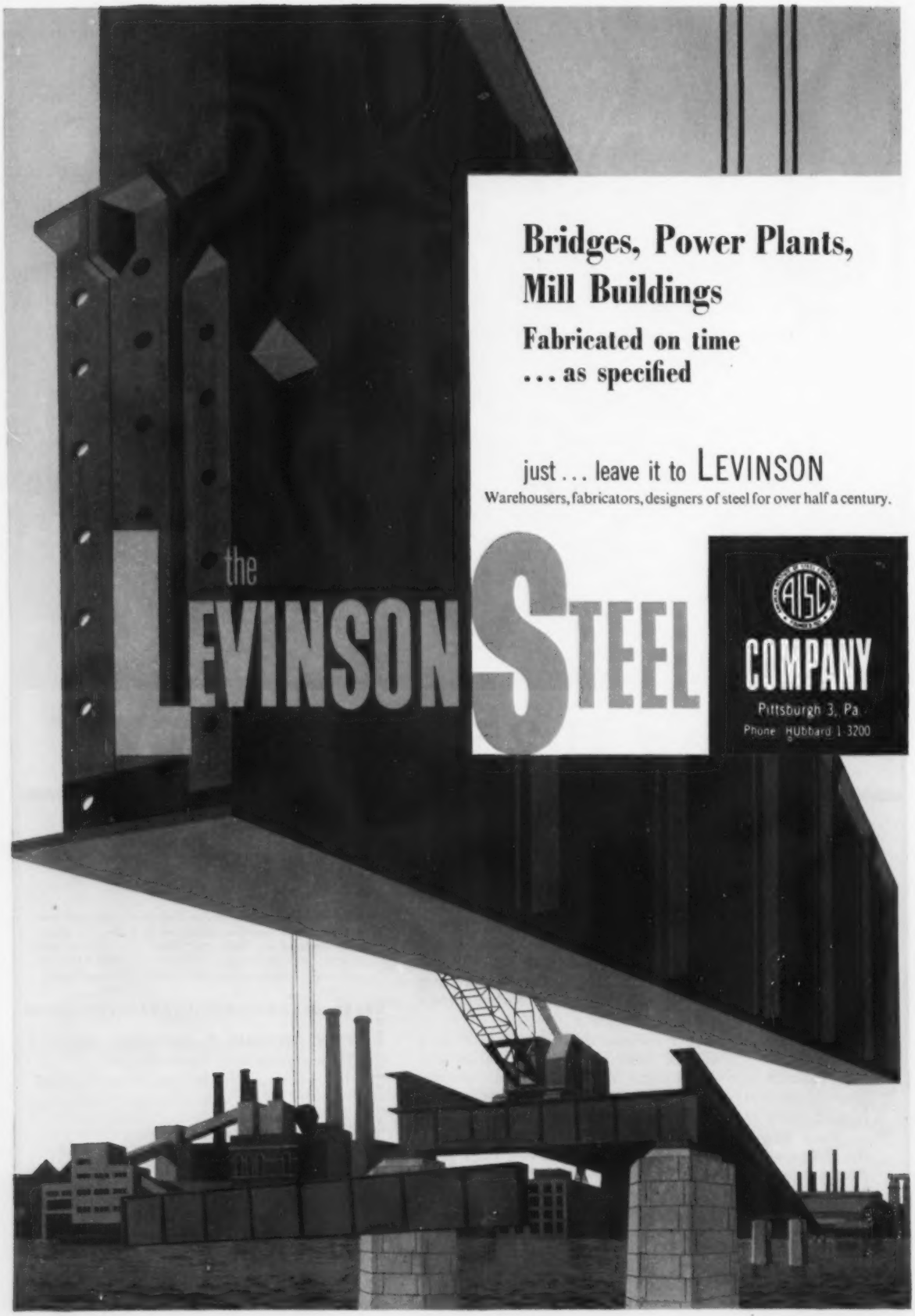
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Mill Buildings
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just ... leave it to LEVINSON
Warehousers, fabricators, designers of steel for over half a century.
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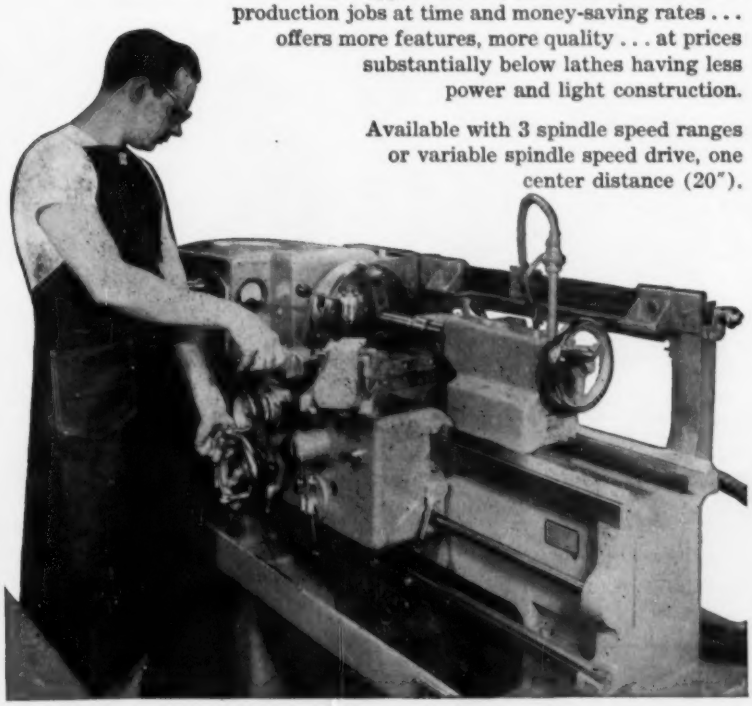
why use GOLIATH when "DAVE" can do the job at **1/2** the cost?

don't pay $20,000 when you can buy a LODGE & SHIPLEY Hi-Turn COPYMATIC TRACER LATHE for less than $10,000

A too-big, too-expensive tool doesn't mean you'll do the job quicker, better or at lower cost. There's new proof of that fact . . . in the 1307 (10") HI-TURN 45° COPYMATIC Tracer Lathe!

This rugged and versatile lathe is built to do production jobs at time and money-saving rates . . . offers more features, more quality . . . at prices substantially below lathes having less power and light construction.

Available with 3 spindle speed ranges or variable spindle speed drive, one center distance (20").



"EXCELLENT FOR HIGH PRODUCTION ON SMALL PARTS," says Indiana Gear Works, Indianapolis

This well-known precision gear manufacturer has a number of Lodge & Shipley lathes in a busy plant. The latest is a Hi-Turn COPYMATIC, evaluated as follows:

SPEED RANGE:
"The wide range of speeds available on this machine is definitely an advantage."

FEED RANGE:
"We are able to select the correct feed for all parts run on the machine."

DINABRAKE MOTOR:
"Speeds production."

HP AMMETER:
"Enables the operator to run the machine at full capacity."

DESIGN:
"Compact, provides ease of set-up."

ACCURACY:
"Good."

For complete details, request Bulletin DM-4 from:

The Lodge & Shipley Co.
3073 Colerain Ave.
Cincinnati 25, Ohio

HERE'S A LINE OF FRICTION BRAKE SYSTEMS

to increase production at lower cost!

Look to Wagner for a broad line of Industrial Hydraulic and Air Brakes that will step up your production—save you money—by meeting your exact needs. Wagner's extensive experience in this field assures proper application based on your requirements of torque, energy absorption and material specifications.

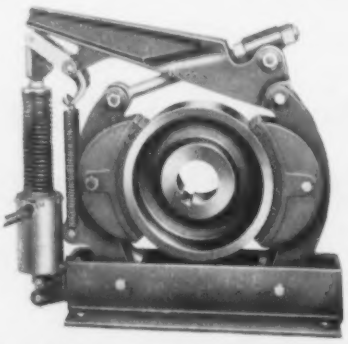
These proven steel industry crane bridge brakes are increasing production rates in other applications.

- Emergency stopping of machinery
- Holding and controlled braking on fluid power drives
- Manual tension control or drag braking
- Remote and manned-trolley controlled service braking and holding
- Special power braking

Let your nearby Wagner Sales Engineer help you select the *right* Wagner Industrial Braking System to meet your requirements. Write for Wagner Bulletin IU-226.

For controlled service braking

Type H—Hydraulic Actuation, Manual or Power Operation. Type A—Air Actuation.

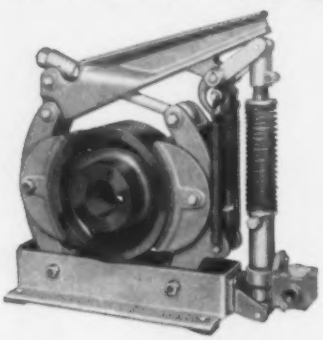


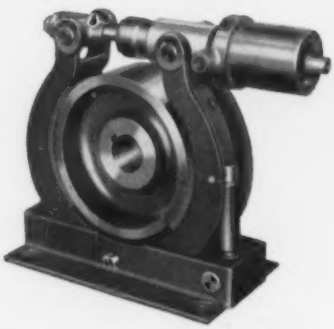
For holding or emergency stopping

Type M—Spring Applied, Hydraulic Released. Type S—Spring Applied, Air Released.

For combined service and holding applications

Type HM and HM-2. Service Brake—Hydraulic Actuation. Holding Brake—Spring Applied, Hydraulic Released.





Type AS. Service Brake—Air Actuation. Holding Brake—Spring Applied, Air Released.

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W158-4

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16 Ton "Gas Mask" for a Blast Furnace

Diversity in the production of steel castings is routine in the foundries of Erie Forge & Steel Corporation. For example, this cast steel blast furnace bell.

The 16 ton lower bell casting teams up with the one ton cast steel upper bell to distribute solids to the blast furnace without loss of gasses . . . a job which requires high quality steel of accurate as-cast dimensions.

From the beginning of the steelmaking process the raw materials are tested at frequent intervals to assure the quality of the steel . . . careful metallurgical and engineering control from scrap pile to finished casting. This is standard operating procedure at Erie Forge & Steel in the manufacture of steel castings and forgings which meet the widely diverse demands of industry . . . another of the many reasons your Casting and Forging requirements are in competent hands here. Consult with us.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

STAINLESS STEEL
produced the way *you* want it by Carlson

Only at Carlson can you buy so many grades of stainless steel in the wide variety of shapes and sizes illustrated here. We regularly process such complete bill-of-material orders. Trained Carlson men, with years of experience and practical knowledge, are determined to give you the best and most efficient service possible.

When you need stainless plate... Carlson gives you what you want when you want it!

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STAINLESS STEEL PLATE . . . rolled to almost any size or thickness, 3/16" and heavier, to meet your individual needs—whether rectangles, circles or special patterns. Substantial tonnage in Types 302, 304, 304-L, 309, 309-S, 310, 316, 316-L, 317, 317-L, 321, 347, 348, 405, 410, 430 and 502-½% Mo. is available for prompt delivery. In addition, two precipitation-hardening grades, Types 17-4 PH* and 17-7 PH* are now in production.

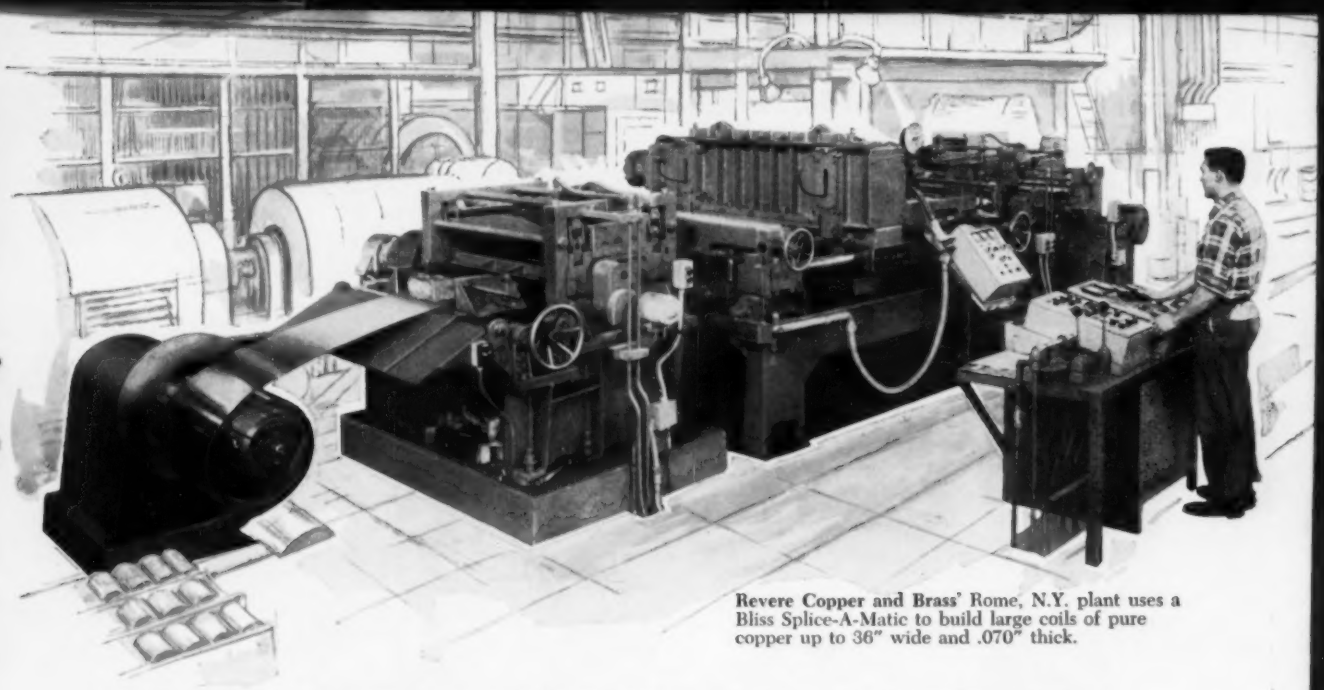
STAINLESS STEEL HEADS . . . in Types 304, 304-L, 316 and 316-L are available from stock in ASME and Standard specifications (10" to 72" diameter). A large assortment of dies is available for pressing other types of heads and special sizes can be spun where practical.

STAINLESS STEEL FORGINGS and SPECIAL PATTERNS . . . including tube sheets, flanges, circles, rings, sketch plates and other specialties can be produced to specification on our versatile equipment.

Also STAINLESS STEEL BARS AND SHEETS (No. 1 Finish).

*Trade mark of ARMCO STEEL CORPORATION

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)



Revere Copper and Brass' Rome, N.Y. plant uses a Bliss Splice-A-Matic to build large coils of pure copper up to 36" wide and .070" thick.

How much could these machines reduce your coil handling costs?

Substantially, if your requirements are at all similar to those of Universal-Cyclops Steel Corporation or Revere Copper and Brass. Universal-Cyclops uses a Bliss Splice-A-Matic welder to cut handling costs in welding carbon and stainless steels, getting ideal welds in even the 300 series.

Revere Copper and Brass uses *its* Splice-A-Matic to build up the larger coils preferred by many of its customers . . . now also finds that these larger coils cut down-time and set-up time in its own subsequent operations.

Just about any weldable material and coil size is practical with the Bliss Splice-A-Matic. It's been used on most alloys in widths to 60" and with both coils and cut-to-length sheets. And complementing the Splice-A-Matic, Bliss offers a complete line of annealers, trimmers, pinch roll stands, levelers, reels, and other units to form a complete, modern coil build-up line.

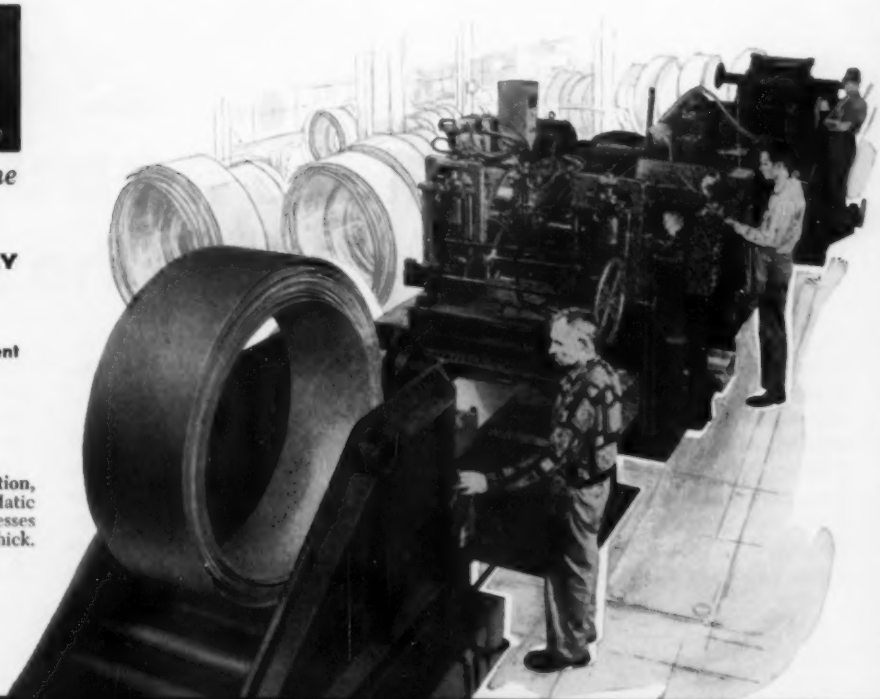
To learn how others are automating their coil handling and cutting costs write today for complete information.

BLISS
SINCE 1857

Bliss is more than a name
. . . it's a guarantee

E. W. BLISS COMPANY
Rolling Mill Division
Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio



At Universal-Cyclops Steel Corporation, Bridgeville, Pa., a Splice-A-Matic successfully welds 300 Series stainlesses 18¾" wide and 0.135" to 0.195" thick.

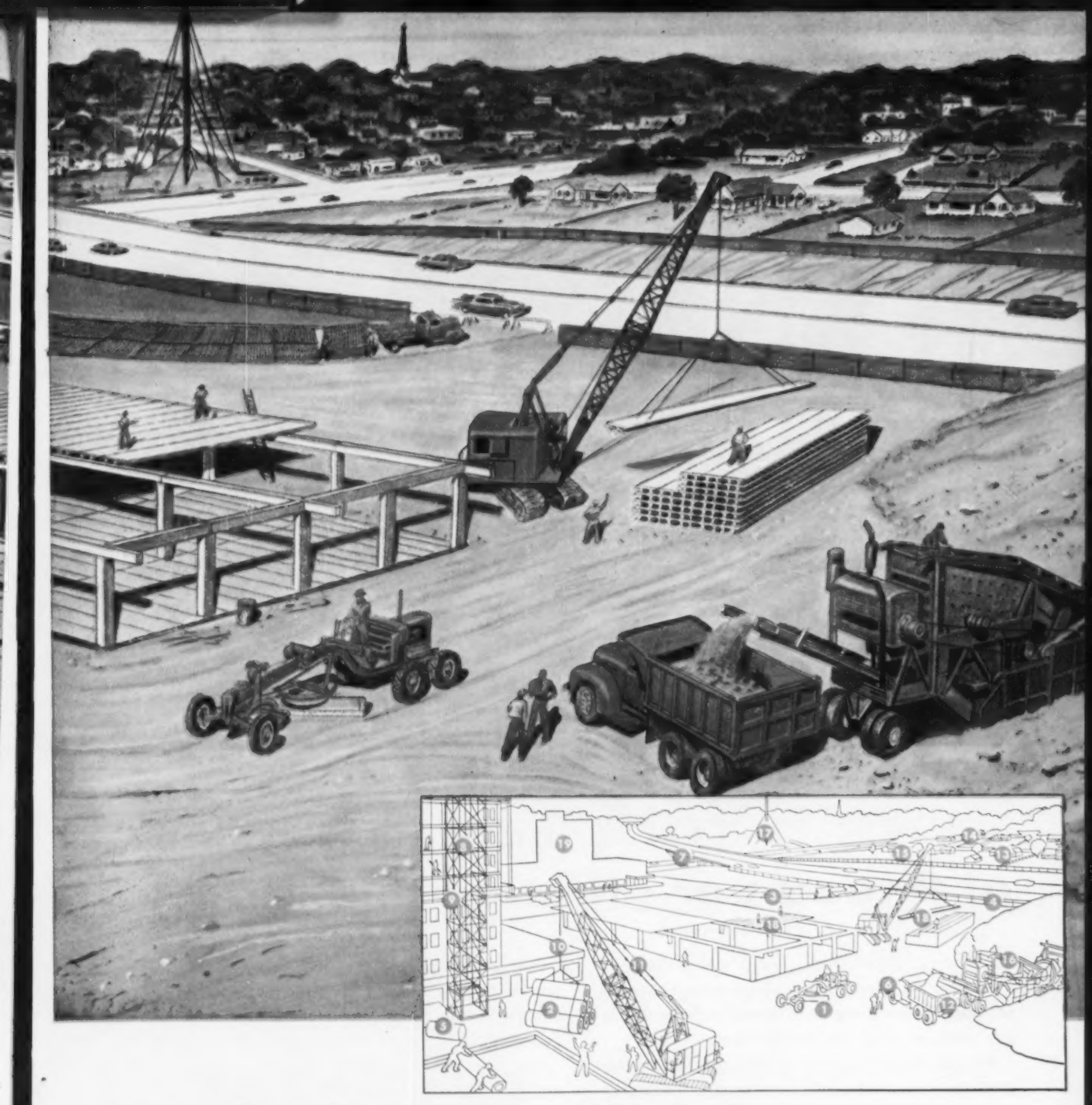
CF&I

STEEL PRODUCTS... used from the ground up

A seemingly endless variety of equipment and materials flow into the construction site for a modern suburban development project. Many of these are made of steel—from structural members to fabricated components... from materials handling to construction equipment. The logistics problem is a complicated one for all the contractors involved.

That's why many contractors... and other big steel users... are turning to CF&I as a single source for many of their steel requirements. CF&I manufactures a complete range of steel products—those shown here and many more. And steel buyers know they can count on quick delivery when they order from this completely integrated producer... know they can count on the top quality that has long been a CF&I trademark.

If you use steel in any form it will pay you to contact the CF&I Sales Representative nearest you.



in suburban development

1. CF&I Cutting Edges
2. Clinton Welded Wire Building Fabric
3. Clinton Welded Wire Road Fabric
4. Realock Chain Link Fence
5. Claymont Flanged and Dished Heads
6. Wickwire Springs and Formed Wires
7. Claymont All-Welded Steel Girders
8. Wickwire Elevator Cable
9. CF&I Hardware Cloth
10. Wickwire Wire Rope and Slings
11. Wickwire Boom Pendants
12. Claymont Alloy Steel Plates
13. Gold Strand Insect Wire Screening
14. CF&I-Wissco TV Guy Wire
15. Perfection Door Springs and Quick Hitch Gate Springs
16. CF&I Space Screens
17. CF&I Galvanized Steel Strand
18. CF&I Prestressed Concrete Strand
19. CF&I Reinforcing Bars (in concrete)

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo Salt Lake City • San Antonio • San Francisco • San Leandro • Seattle • Spokane • Wichita

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CF&I OFFICES IN CANADA: Montreal • Toronto

5544

VERS-O-TOOL cuts 10.3 miles of thread per grind on this job . . .

The Federal Screw Works had a real problem in threading. They had received a large order for 1"x13" adjusting screws. Using most thread cutting methods this would be a big, costly assignment.

Federal put a Namco 1⅝" DR Vers-o-Tool on the job and as a result, found they had to grind the chasers only once for approximately 2000 pieces. This means that each grind cuts well over 10 linear miles of thread. Threading cost per piece was amazingly low.

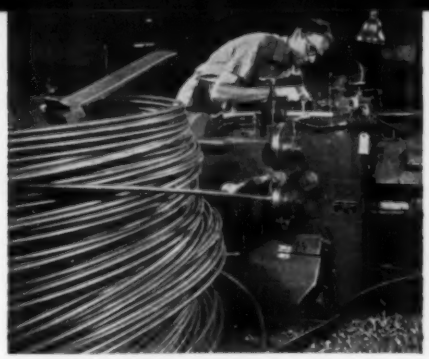
Remember, Vers-o-Tools can be used with your present turning equipment, lathes, drill presses or automatics. No investment in special machines required.

Find out how you can put Vers-o-Tools to work reducing your thread cutting costs. Write for a free copy of Booklet DT-52.

You can grind and regrind Vers-o-Tool circular chasers to a full 270° of the chaser circumference.

National Acme

THE NATIONAL ACME COMPANY, 175 E. 131st St., CLEVELAND 8, OHIO • Sales Offices: Newark 2, N. J., Chicago 6, Ill., Detroit 27, Mich.



This modern Cold Header forces wire drawn from Youngstown Rods to flow inside the dies. It spills out bolt or screw blanks by the thousands— every hour, all day long.

Accent on Excellence

Youngstown cold heading and scrapless nut quality rods and bars

Russell, Burdsall & Ward Bolt and Nut Company of Port Chester, N. Y. is one of the world's largest and best known fastener producers with plants at Coraopolis, Pa., Rock Falls, Ill., and Los Angeles, Calif. They stated in one of their recent advertisements:

"The cold heading method (an RB&W development that revolutionized bolt making) calls for use of uniform, high quality raw material. With constant quality control, RB&W makes sure our cold headers get the proper 'diet'."

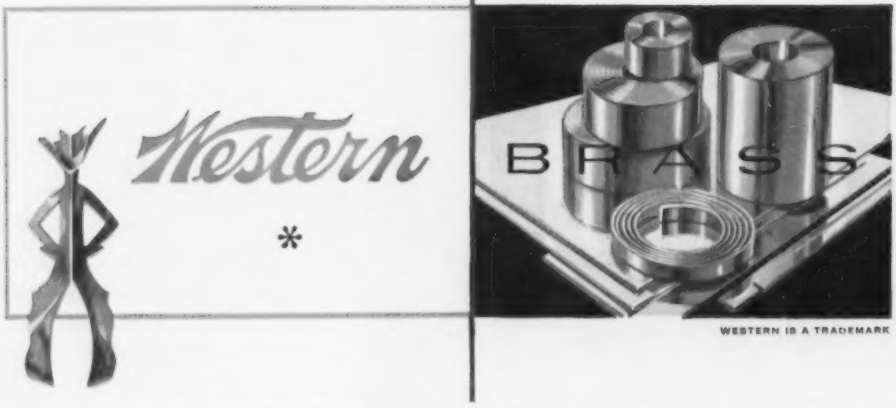
Youngstown's Cold Heading and Scrapless Nut Quality Rods and Bars in coils answer RB&W's rigid requirements. They find them to be internally sound, uniform in both physical structure and chemical composition—as well as free from injurious seams and slivers, which cause rejects, reduced profits.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel
Youngstown, Ohio

If you're interested in a *modern metal* you should research *brass*... especially Western Brass... it's "*tailor-made*" for each job!



WESTERN IS A TRADEMARK

* Sheet and Strip Specialists in Brass and Copper *

The man from Western is only a phone call away

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Western BRASS

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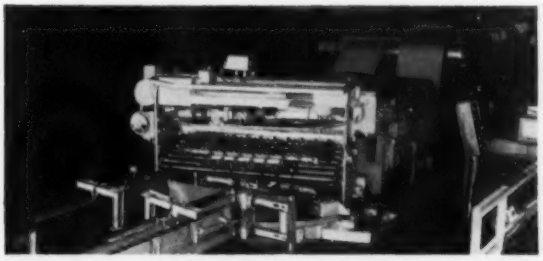
Cincinnati Shear swivels for mitre cuts at Budd



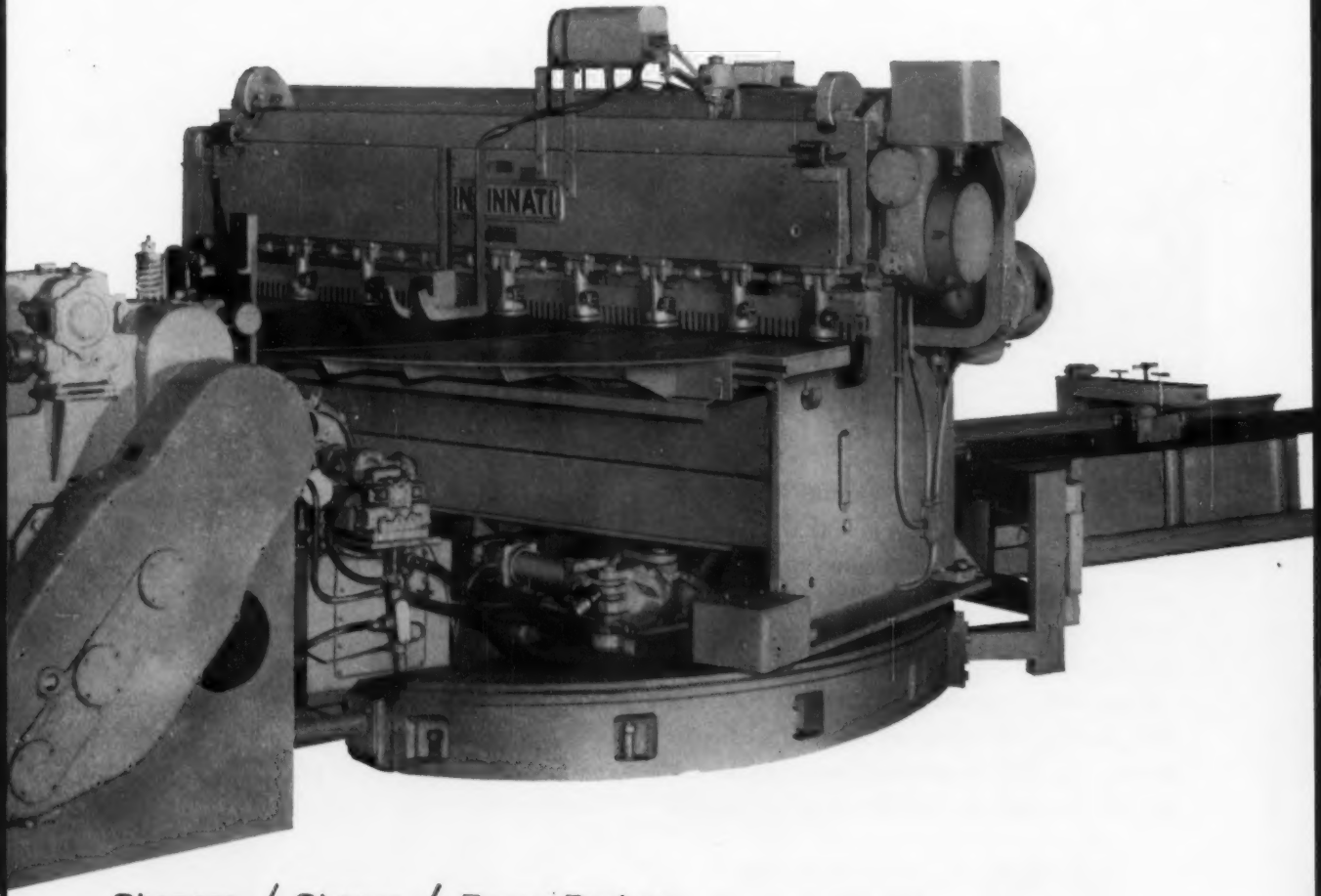
This Cincinnati Shear is an integral part of an automatic decoil and shear line at The Budd Company's Gary, Ind., plant. It is used for straight and mitre shearing of coil stock into sheets.

Mounted on a swiveling base, the shear can be rotated 22½° to either side of center, so the operator can pre-set the desired angle of cut.

Accuracy must be within ⅛″ per 80″ of feed. Sheet widths range from 24″ to 72″ and thickness from 21 to 16 gauge (.0349″ to .0625″). Since the operation must be automatic and continuous to be economical, Cincinnati dependability is a vital asset.

This shear was specially engineered for The Budd Company. However, most of its profitable features are available with standard Cincinnati Shears. They include powerful hydraulic hold-downs, all-steel interlocked construction, and one-clearance shearing of different metal thicknesses.

Complete details on Cincinnati All-Steel Shears are included in Catalog S-7R. Write to Dept. B.



Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

The Ames Aeronautical laboratory at Moffett Field, California, uses this milling machine capable of producing a complex curvature such as airfoil model in one milling operation. The machine weighs 150 tons, and was designed and built by Danly Machine Specialties, Inc.

Completely powered by a Reliance V★S, this new machine can sculpture in metal a complex airfoil shape at a fraction of the time and cost required to produce a similar shape by conventional machine tool and handwork methods.

Working at tolerances of better than plus or minus 0.004 in., the Reliance V★S Drive must provide variable speeds between the milling cutters which shape the blank and the pattern table where the pattern is mounted.

A Reliance V★S Drive was specified by Danly to power this new mill because of its ability to perform accurately, even under adverse conditions.

Write or call for further details. D-1565

RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 26A, CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONTARIO

Sales Offices and Distributors in Principal Cities

This lightweight "No Charge" spool is typical of Roebling's modern packaging methods that save customers time and money.

Are You Getting What You Pay For?

When you pay for HIGH QUALITY high-carbon wire, you want to be sure you get it. You do, when it is supplied by Roebling.

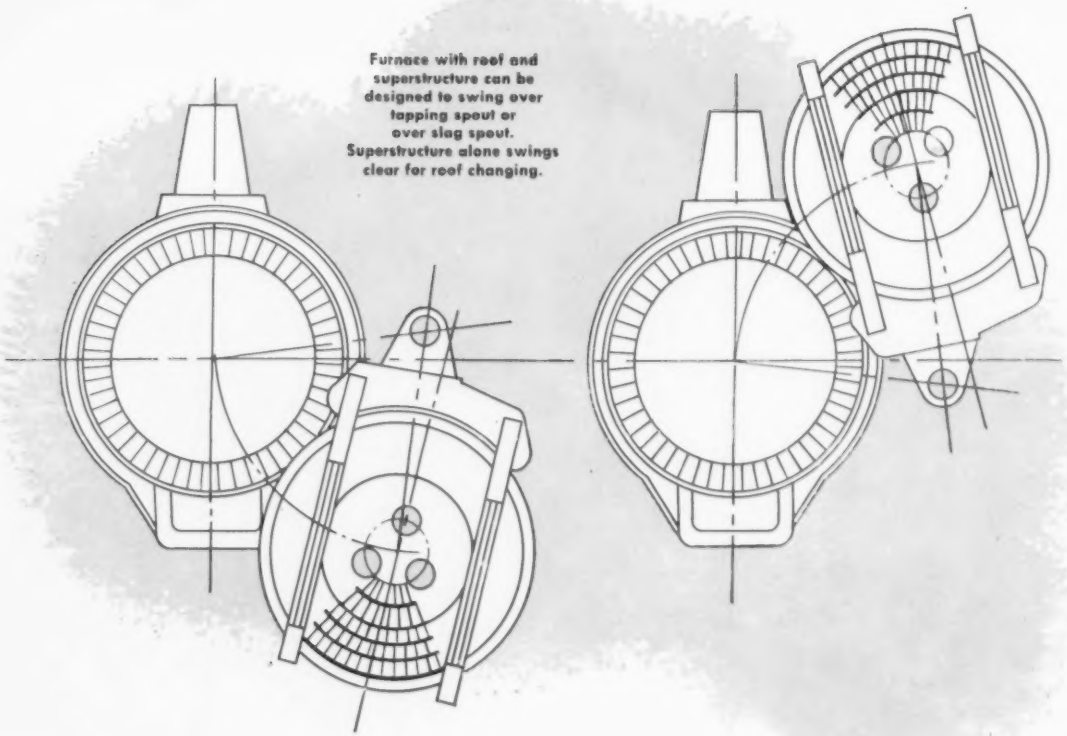
It is unsurpassed in quality, consistently true to specifications, and absolutely uniform in gauge. Hundreds of manufacturers attest to this fact . . . the qualities that they *pay* for—they *get* in Roebling high-carbon wire. The length of our relationship with customers proves it.

We'll be glad to show you what we mean. For information on superior high-carbon wire or cold rolled strip, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it


Furnace with roof and superstructure can be designed to swing over tapping spout or over slag spout. Superstructure alone swings clear for roof changing.

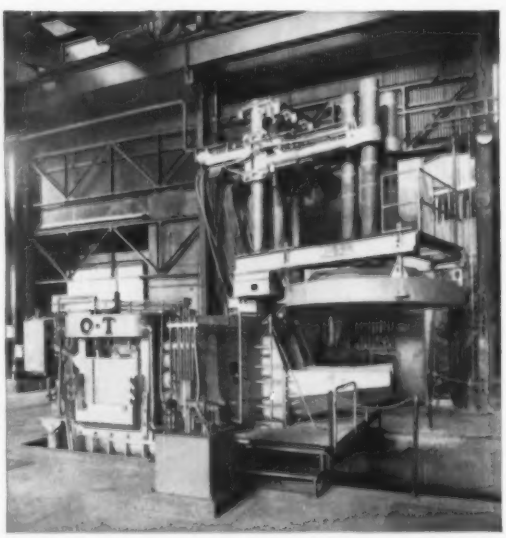
With a Lectromelt Furnace you have a choice

THE ROOF CAN BE BUILT FOR FRONT OR BACK SWING

SELECT the direction of swing that best fits your plant layout—over the tapping spout or over the slag spout. Lectromelt's design and method of separately supporting the roof structure makes this possible. You profit by the greater efficiency and convenience that result.

Note in the above drawing how the furnace top swings clear of the furnace; there's no interference with the charging bucket to slow down the charging operation. Lectromelt places the pivot point away from the furnace shell to accomplish this. And, because the swing of the top can be less, there's less strain on the conductors.

Catalog No. 10 describes Lectromelt furnaces. For a copy write Lectromelt Furnace Division, McGraw-Edison Company, 312 32nd Street, Pittsburgh 30, Pennsylvania.



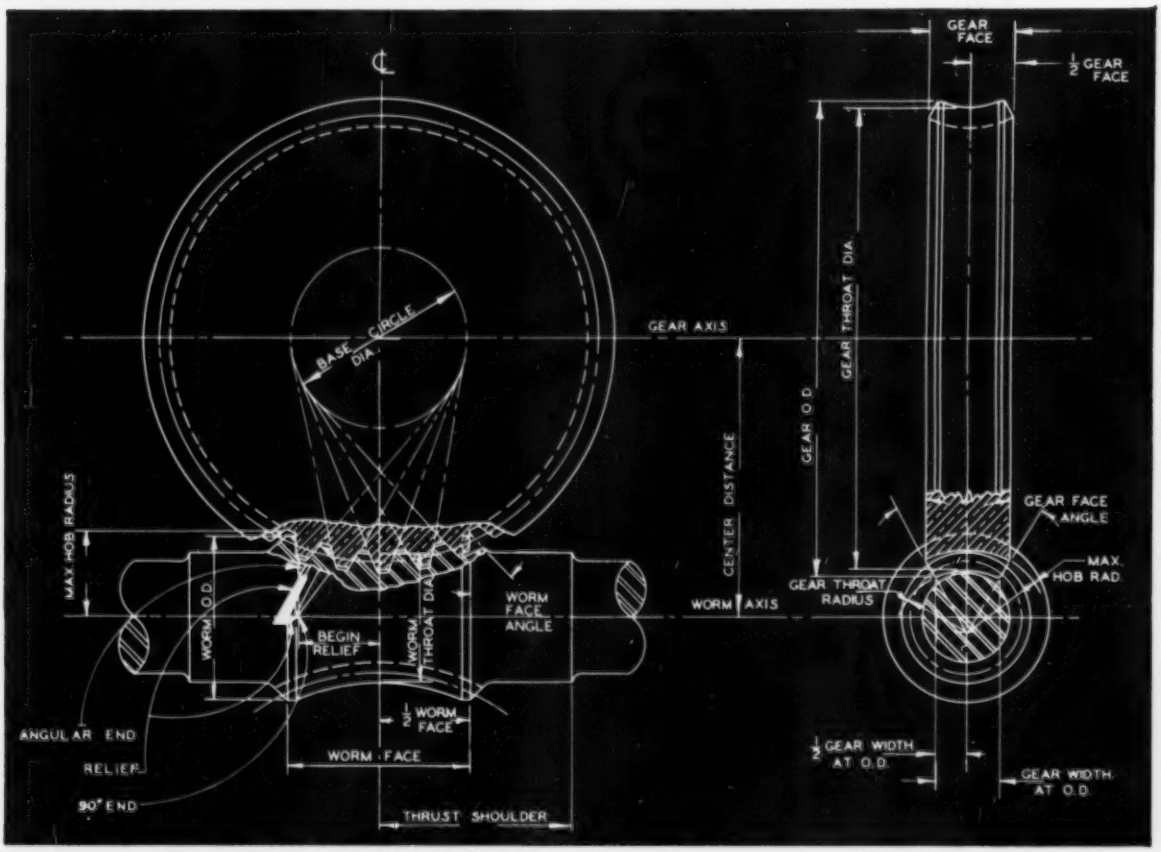
Lectromelt®

McGRAW EDISON

CANADA: Canefco Limited, Toronto . . . ARGENTINA: Master Argentina, Buenos Aires . . . ITALY: Forni Stein, Genova . . . ENGLAND: Electric Furnace Co., Ltd., Weybridge . . . GERMANY: Demag-Elektrometallurgie, GmbH, Duisburg . . . SPAIN: General Electrica Espanola, Bilbao . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Stein & Roubaix, Bressoux-Liege . . . JAPAN: Daido Steel Company, Ltd., Nagoya

STANDARD SIZES UP TO TWO HUNDRED TONS CAPACITY

WORM GEAR DESIGN . . . *Bulletin #200*



Bulletin 200 has 20 pages crammed with 38 formulae, such as the Formula for Class I AGMA Horsepower Rating:

$$P = K_1 K_m K_v \frac{n}{mg}$$

Step-by-step instructions, with typical examples, enable you to quickly determine the size worm gearset you need to meet any horsepower and service required.

You can calculate the bearing loads and sizes needed for the worm and gear shafts.

You can check the worm root stress and gear tooth stress.

Efficiency is charted against helix angle with modifications for required speed so you can quickly determine efficiency.

One quick look at the drawing above will convince even the uninitiated that no other worm gearset has so many teeth in contact. No other worm gearset is so simple to design and rate. No other worm gearset will carry so much load in so little space with so little weight.

Now, Bulletin 200 provides complete design and application data on space-saving double-enveloping worm gearing. Ask for it without obligation.

CONE-DRIVE GEARS DIVISION MICHIGAN TOOL COMPANY

7171 E. McNichols Road • Detroit 12, Michigan • Telephone: TWinbrook 1-3111

DOUBLE-ENVELOPING WORM GEARSETS

DOUBLE-ENVELOPING WORM GEAR SPEED REDUCERS

DOUBLE REDUCTION WORM GEAR SPEED REDUCERS

DOUBLE-ENVELOPING RIGHT ANGLE GEARMOTORS

. . . performance beyond the usual . . .

ROLLWAY

MAXIMUM

BEARINGS

Design of high-speed precision machinery often calls for bearings which offer the utmost in load capacity, "hot hardness", dimensional stability. Each machine presents its own exacting requirements.

Fulfillment of unusual requirement combinations is a specialty at Rollway. Your selection of exactly the right precision radial cylindrical roller bearing is assured by:

- **A broad range of types and sizes, numbered in the thousands**
- **Retainers of standard bronze or "Rollube" ferrous alloy, in roller-riding, land-riding, or broached construction**
- **Crowned rollers**
- **Modification of any factor to meet your application**

To further implement your choice, the Rollway Catalog and Engineering Data Book contains the first listing, by any manufacturer, of the thrust capacities of cylindrical radial roller bearings.

ROLLWAY BEARING CO., Inc., Syracuse 1, N. Y.

ENGINEERING OFFICES

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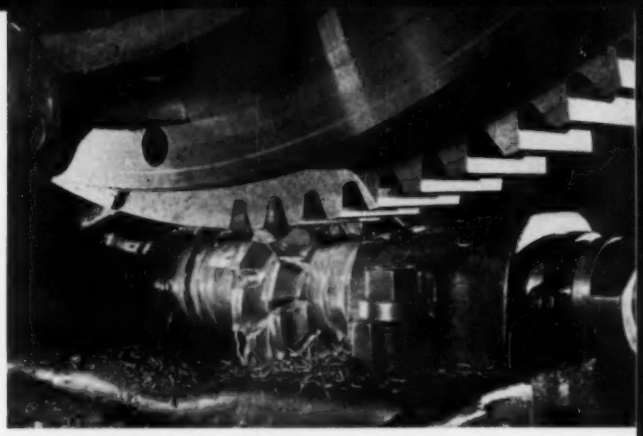
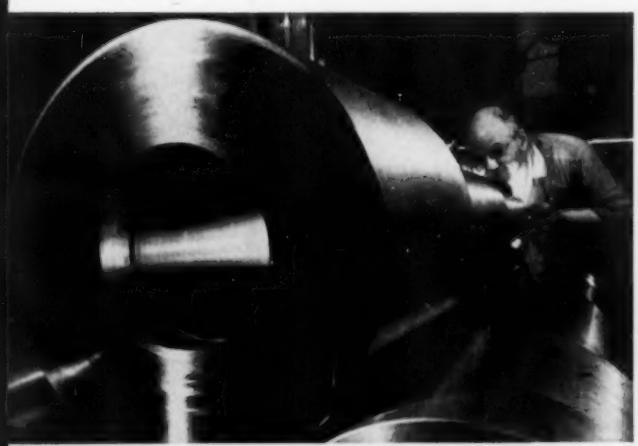
Houston • Los Angeles
Philadelphia • Toronto

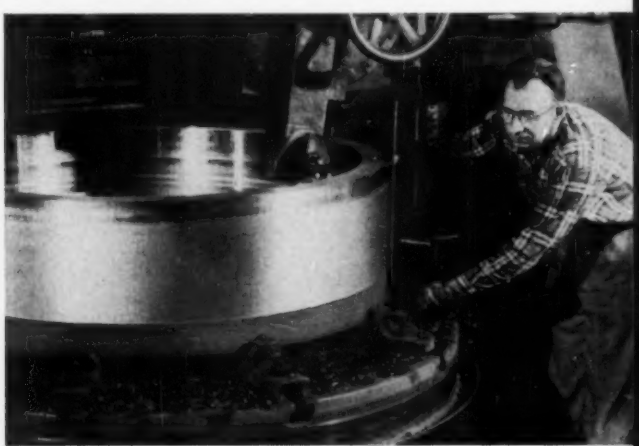
SAVES $150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged $180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately $150 per gear.



8-HOUR JOB DONE IN 3—Another manufacturer reports that roughing and finishing a gear required a total of 8 hours and 8 minutes on his gear cutter. With freer-machining Hi-Qua-Led Steel and the increased speeds and feeds it permits, the job is now completed in just 3 hours and 10 minutes.



700% INCREASE IN TOOL LIFE—In trepanning a 4 in. diameter hole 42½ in. long with a Warner & Swasey lathe, tool life averaged one piece per tool. With Hi-Qua-Led, 8 pieces are now obtained with the same tool. Manufacturer reports that Hi-Qua-Led Steel also provides much better chip formation.



TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-leaded steel.

HOW ALCO'S EASY-MACHINING HI-QUA-LED STEEL* FORGINGS CAN CUT YOUR PRODUCTION COSTS

The easy machinability of ALCO's Hi-Qua-Led Steel* forgings is setting new production records throughout industry. In case after case, a switch to Hi-Qua-Led Steel forgings has resulted in greatly reduced machine time, longer tool life and improved surface finish with closer tolerances.

These unique cost-cutting benefits are provided by Hi-Qua-Led Steel forgings with all the other physical characteristics of regular steel in the same AISI grade. You get the same service in your end product.

ALCO specialists will be happy to demonstrate these profit-boosting characteristics on your own machines, in your own plant. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide.

For a technical booklet on Hi-Qua-Led Steel forgings, write ALCO Products, Inc., Dept. 155, Schenectady 5, N. Y.

***HI-QUA-LED STEEL**—ALCO's registered trademark for its special process leaded steel forgings that are making outstanding reductions in machining time, tool wear and production costs

ALCO

ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES · DIESEL ENGINES · NUCLEAR REACTORS · SPRINGS · STEEL PIPE · FORGINGS · OIL-FIELD EQUIPMENT

YOU'VE RELIED UPON THIS MARK FOR *QUALITY*...

now... look to it for a new solution to your steel inventory problems

Here's how Carpenter's *doubled capacity* will help you keep steel inventories at *realistic levels* and cash tie-ups *at a minimum*, through both high and low demand periods:

You know the cost of excessive inventories. You tie up cash precisely when you need it most. Large inventories cost much more to carry than the inventory you actually need for current production.

Now . . . through Carpenter's acquisition of electric furnace steelmaking facilities in New England (which *doubles* our ingot capacity) we've approached this problem from *your* side of the fence.

Today, you're doing business with a company *twice* as big as it was a year ago. This permits us to provide a plan by which customers can *reserve mill output ahead* of time . . . eliminating the need to protect yourself by ordering far ahead . . . eliminating the necessity for placing excessively large orders in periods of peak demand.

And if you order steel out of local warehouse stocks, this same plan assures continuous, dependable deliveries.

Now, and when steel demand is again on the upswing, we are putting steel "in the bank" for you. We are carrying extra large stocks of semi-finished steel in reserve . . . enough to take care of emergencies for all customers subscribing to the plan. Moreover, we can offer this plan to *more* steel users than ever before!

Today, while we're implementing this new service, is the time to go along with us. By acting now, you assure yourself of a steady supply of Carpenter top quality Tool, Stainless and Alloy steels right through the next period of peak demand.

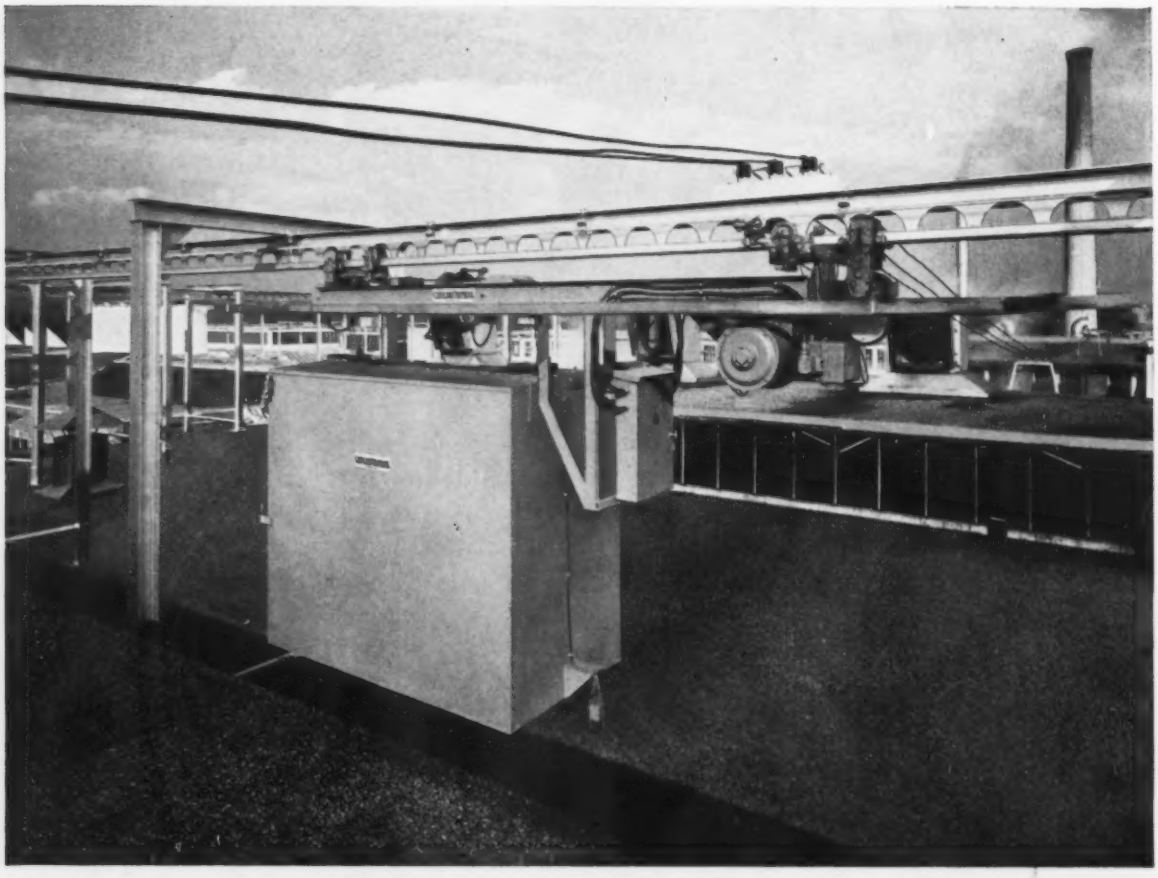
WRITE TODAY FOR "Can We Halt the Plague of Periodic Inventory Buildup?" Recently released, this special report gives you full details on how Carpenter's plan can help you keep inventory costs at a minimum!

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.

Alloy Tube Division, Union, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.
Webb Wire Division, New Brunswick, N. J.

AUTOMATIC Materials Handling System Operates On Roof

Has paid for itself several times over since installed



THE box-like structure that you see in the photograph above is a traveling van that measures 4'-0" x 8'-0" x 6'-6" high. It is built into a motorized carrier that travels over an extensive Cleveland Tramrail system built on the roof of a large prominent plant.

A large door at the opposite end of the van is swung open during loading. Pallet loads of materials are brought inside the van and set in place. 3000 lbs. can be handled with this particular unit per trip. Other larger units are available.

No special operators are required for the Tramrail system, as it can be kept going easily by the production machine operators along with their regular work. After the van is filled, pressing a button starts the load on its way. The van first travels upward until it is above the roof. Then it goes forward over the extensive track system. When it reaches the roof over one of the two receiving stations, as preselected, it makes the vertical descent to the floor. Here the door is opened and materials removed.

This system brings distant departments close together so that they can operate as efficiently as if they were adjacent to each other. It eliminates need of wide load-carrying aisleways — and thereby saves considerable floor space. It avoids confusion and danger of floor trucks which would normally be required. It greatly cuts costs by drastically reducing time required for materials handling. In fact, the savings made by this system have been so great that it has paid for itself several times over since installed.

Very likely you, too, can make big savings by putting to work that big unused roof of yours. Cleveland Tramrail engineers stand ready to show you how.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4820 E. 290 St. • WICKLIFFE, OHIO

MOLY NEWS

CLIMAX MOLYBDENUM CO. DIVISION • AMERICAN METAL CLIMAX, INC.

Climax Develops an Extremely Tough, Abrasion-resistant Chrome-Moly White Iron

New Alloy Proves Superior in Erosive Applications

A new martensitic white iron has proved exceptionally tough and resistant to abrasion. It's called Alloy 42. Its excellent combination of properties are related to its structure — which consists of hard chrome-moly carbides favorably distributed in a matrix of martensite plus retained austenite.

Tests indicate Alloy 42 is especially economical for parts subject to erosive wear: sand pumps, flotation impellers, sand classifier wear shoes, pug mill blades, brick mold liners and chute liners.

For example, heat-treated Alloy 42 impellers in a 5" sand pump handling coarsely ground taconite ore have already lasted over 1,000 hours. Previous impellers made of a 4.5% Ni, 1.5% Cr type of martensitic iron lasted only 350 to 400 hours.

Because of its toughness, Alloy 42 can also be used where moderate impacts would cause low alloy types of white iron to break or spall. And it may prove more economical than the soft rubber parts or linings now used in various abrasive applications. Its resistance to tearing by tramp coarse materials and chemical attacks by oils and other organic compounds is an obvious advantage.

The recommended composition range is: Carbon 3.00-3.50%; Silicon 0.30-0.60; Manganese 0.60-0.90; Chromium 15.0-18.0; Molybdenum 2.75-3.25.

A Climax bulletin on Alloy 42 discusses melting and casting, molds and shrinkage, heat treatment, structure, physical properties, machinability, welding and cutting. *For a free copy, circle #1 on the coupon.*

Heat Treating Improves the Wear Resistance of Gray Iron

Heat treating can improve many of the properties of gray iron, particularly resistance to wear. Wear resistance in quenched-and-tempered gray iron is many times greater than that of pearlitic irons. With cams and similar parts, hot quenching provides better wear resistance than quenching and hardening to the same hardness. Surface hardening is frequently selected for gray iron because it locally improves wear resistance with minimum distortion.

Why Moly Iron Bulletin #6 contains valuable information on surface hardening, annealing and stress-relieving molybdenum-alloyed irons. This bulletin gives examples of improvements obtained by heat treating gears, cable drums, pump-ring castings, tappets, valve guides and machine tool ways.

Flame hardening the teeth on a sprocket improves wear resistance with minimum distortion.

*For a free copy of **"Why Moly Iron Bulletin #6,"** circle #2 on the coupon.*

Tempering Low-Alloy Creep-Resistant Steels

A recent British paper discusses the roles of chromium, molybdenum and vanadium in low-alloy steels with high creep strength. The relation between creep properties, microstructure changes and carbide composition is given special attention.

*For a copy of **"The Tempering of Low-alloy Creep-resistant Steels Containing Chromium, Molybdenum and Vanadium"** by E. Smith and J. Nutting, circle #6.*

Moly Helps High Alloys Fight Corrosive Attacks

Highly alloyed materials are playing a greater part in combating corrosion. A current paper on these alloys considers the molybdenum-bearing alloys at length and also discusses cobalt-base alloys and silicon-bearing alloys.

*For copies of this paper, **"High Alloys to Combat Corrosion"** by E. D. Weisert, circle #7.*

Thermenol Shows Excellent Resistance to Heat, Corrosion

Thermenol, an iron-aluminum-molybdenum magnetic alloy, compares favorably with other high-temperature materials, and in some cases promises even better service. For unlike many alloys, it doesn't lose tensile strength rapidly up to 1200 F. It also has excellent resistance to oxidizing and sulfur-bearing atmospheres at high temperatures.

*For a copy of **"Iron-aluminum Magnetic Alloy Has Excellent Heat Resistance,"** circle #8.*

Moly in Nickel-base Casting Alloys Improves High Temperature Service

Molybdenum is helping at least two nickel-base alloys to work more effectively in high temperature applications. One of the alloys, with 5% Mo, combines good castability with very good creep strength at temperatures up to 1800 F (much better than that of moly-free alloys). The second, with 10% Mo, shows high resistance to thermal shock.

*For free copies of **"Some Properties of Nickel-base Casting Alloys for High-temperature Service"** by D. R. Wood and J. F. Gregg, circle #3.*

Cast Steels Studied at Low Temperatures

The British Steel Castings Research Association has completed new studies on the effect of melting practice, composition and treatment of steel castings. Five of the seven alloy steels investigated contained molybdenum. The benefits of using molybdenum in low alloy steel castings for low temperature service are clearly shown in comparisons of 1.5% Mn and 1.5% Mn-Mo.

*For reprints of **"The Low-temperature Impact Properties of Cast Steel"** by W. J. Jackson and G. M. Michie, circle #4.*

New Data Available on Low Carbon Bainitic Steels

Studies have been made on new steels based on boron-0.5% Mo. Tensile strengths up to 180,000 psi can now be obtained within the bainitic range with a wide range of cooling rates. Thus these low-carbon bainitic steels offer a good combination of mechanical properties as-rolled or as-air-cooled. These properties can be obtained in large sections because hardenability is high. Good welding properties and tempering characteristics make the steels especially suitable as high-strength weldable steels, forgings, die blocks, etc.

*For copies of **"Low-carbon Bainitic Steels"** by K. J. Irvine and F. B. Pickering, circle #5.*

Climax Molybdenum Co. Division, Dept. 2
American Metal Climax, Inc.
500 Fifth Avenue, New York 36, N. Y.

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Cut sheet steel costs with Ryerson service

Cut inventory costs

No need to tie up capital in inventories—and valuable shop space—when you can get immediate delivery of your requirements, large or small, from large and complete stocks at your nearby Ryerson plant.

Cut scrap losses

Why pay sheet steel prices for scrap like this? When your size can be furnished from standard-width coils, Ryerson cut-to-length service gives you the important savings of a net weight price—eliminating scrap costs. In addition, mill-type slitters enable Ryerson to furnish any width requirement.

Cut fabrication costs

Ryerson stocks of hot and cold rolled sheets are quality-controlled to .10 maximum carbon content (SAE 1008). This means you can minimize, or even eliminate, the problems of variations in forming and welding quality caused by the average wide range of carbon content.

Ryerson service delivers your order tightly banded, skidded with sound lumber, to further cut your labor costs, add protection to the steel and make handling far easier.

RYERSON CERTIFIED QUALITY

RYERSON STEEL®

Member of the INLAND Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Production Gaging at Hand

Numerical controls are to be applied to production precision gaging in the near future. A reliable source reports a leading manufacturer of electronic gaging equipment has at least one such development near the announcement stage. Advantages would be greater precision than possible with manual inspection and more consistent quality control.

Fasteners Impact Extruded

Small impact extrusions are getting increased attention from fastener makers. A wide variety of small parts for the auto industry and other mass-quantity buyers is possible with this method at a savings in material. Major hurdle is working out proper tool and die design for high-speed production. Some firms have made starts and are ready to go full speed based on initial good results.

Insulated Aluminum Siding

A new siding for home use combines aluminum with fiber glass insulation. It's a laminate made up of a contoured aluminum clapboard rolled from 0.025-in. stock, a fiber glass blanket, and a coated aluminum reflective sheet. A baked enamel coating cuts siding maintenance.

Potential Source of Info

A huge collector of foreign scientific journals and papers, the Central Intelligence Agency has promised Congress to turn over its files to any new government clearinghouse that may be set up for translation and dissemination to industry and research groups. CIA translates only about 2 pct of what its agents collect.

Research on Cutting Speed

A recent test cut with sintered oxide tools achieved a cutting speed of 26,000 sfpm at 0.0053-in. feed and 0.020-in. depth of cut. The metal removal rate was 33.3 cu in. per minute on the carbon steel sample. One of the objects of the test was to evaluate power consumption. It had been thought that above a certain speed power consumption would remain constant or decrease. But the test showed that this effect would have to occur at speeds appreciably higher than this.

Protection for Light Alloy

A recently created alloy, magnesium-thorium, is both lighter and stronger than aluminum. But it's too soft to serve without protection in missile applications. A new ceramic coating boosts abrasion, corrosion and erosion resistance, as well as tensile strength of the material. Coatings of 0.001 and 0.002-in. thickness are being tested for missile applications.

Flexible Steel Sandpaper

A new all-steel sandpaper quickly rasps, sands, and smooths hard and soft woods, plaster, plastics and soft metals. Comparable to medium grade, the flexible sheet outcuts conventional sandpaper by at least five to one and outlasts it more than ten to one without clogging. Provided in rolls 4½-ft wide and up to 1600-ft long, the 0.004-in. sheet is prepared by punching 0.036-in. holes in a uniform wave pattern at 150 per sq in.

Sheet Inventories Too Low?

Warehouses continue to report outside orders, particularly in flat rolled products. Orders of 40,000 lb are again increasing in frequency. It's part of the explanation for the quick turnabout in warehouse estimates of adequacy of inventories. General concensus: Warehouse sheet inventories are too low.

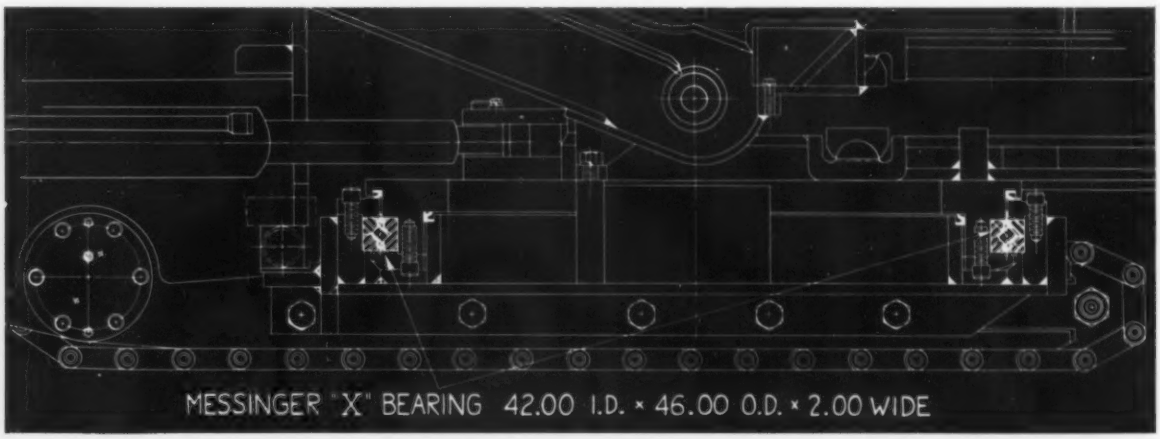
Light Car Development

Tooling for Chevy's entry into the small car field is well underway. It's reliably reported that much of the machine-tool capacity will be drawn from existing facilities. On present production schedules, Chevy parts plants can easily take on the 70 car-per-hour volume anticipated. Engine is an all-aluminum, air-cooled six to be produced on new transfer line since present automation equipment is not suited to this design.

Modern methods of mining coal require the most efficient and most rugged machinery one can build. To accomplish this, JOY MANUFACTURING COMPANY engineers selected MESSINGER bearings for the turntable of their Continuous Miner.

The photo above shows the JOY miner in a coal mine, its digger nose chewing out chunks of coal and rock, and the conveyor part taking them away.

The flexibility and low maintenance of this unit makes it a "JOY" and the MESSINGER bearing helps to attain this flexibility and low maintenance.



Smoothing Industry's Pathway ...*for Nearly Half a Century*

MESSINGER BEARINGS, INC.

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PHILADELPHIA, PA.

RADIAL, THRUST AND COMBINATION ROLLER BEARINGS • BALL BEARINGS

SOVIET STEEL expansion trend is to the east, which contains 75 pct of the country's coal and hydropower potential.

Russia Steps Up Drive For More Capital Goods

Russia is pulling out all the stops in its move for industrial leadership.

Mechanization is being speeded and capital goods output is way up. Consumer needs may slow the pace.

■ In the millions of words and hundreds of personal conversations that have explored the threat of a shooting war between the Soviet Union and the Free World several facts emerge: (1) The peoples of the world don't want one; (2) the governments of the Free World don't want one, and (3) the intentions of the Kremlin are not clear on this point.

Problem: How to convince the Kremlin that Russia can't win such an unnecessary war? From which you derive a second problem: If a shooting war could be ruled out, what is the economic war threat? And it is a threat that has been voiced by none other than Soviet Premier Nikita S. Krushchev. Speaking of economic competition, Krushchev said: "When we win we shall also re-educate you."

Why then send an American steel delegation to the Soviet Union under an agreement that permits an equal number of Russian steel people to return the visit? What does the U. S. stand to gain by this and why should the Kremlin permit it?

Step Up Automation—Obviously, the Kremlin expects its delegation to add to Soviet technical knowledge. Despite some recent talk to the contrary, the Reds don't know everything: They have a lot to learn,

For a first-hand report on the visit of the American delegation through Russian steel plants, see Editor G. F. Sullivan's article on p. 73.

What Things Cost in Russia

Item	How much work to buy*
Suit, man's	1¾ months
Shoes, man's	10 days
Shoes, woman's	1 week
Shirts, man's	2.4 days
Overcoat, man's	1½ months
Dress, cotton, woman's	2 days
Suit, woman's wool	3 weeks
TV set (7-in screen)	7-10 weeks
Radio set	1month
Automobile, 4-cylinder Pobeda sedan	3½ years
Rent, 1-room apartment	1 day
Beef (lb)	1½ hours
Bread	17 minutes
Butter (lb)	3½ hours
Sugar (lb)	1 hour 20 min.
Cigarets (25)	1 hour 50 min.

*Average earnings in USSR industry were 3.5 rubles per hour, 700 rubles a month. Steelworkers averaged about 14.2 pct above this. Earnings are now slightly higher.

Data: U. S. Dept. of Labor, from official sources. Average USSR workweek in industry: 6-days, about 40 hours.

Base Pay in Red Steel Industry

Work Category	Rubles Per Month
Common labor	450–600
First melter	1350
Melter	2000
Foreman or technician	2400
Graduate engineer (starting)	1000
Department head	4000–4400
Crane operator	1000
Ladle crane operator	1400

Sickness, vacations, pensions, etc., are also provided all Soviet workers. Base pay does not include premiums for meeting quotas, overtime, etc. This is based on mid-1957 figures. Rates were raised in late 1957.

In the U. S., average hourly earnings in steel during the last half of 1957 were about $2.72. Costs of hospitalization, vacation pay, pensions, etc., are not included in the U. S. figure, which would then be about 20¢ per hour higher.

for instance, in rolling mill techniques; Russia has an acute labor shortage; and, finally, productivity in steel, as in other industries, is far below that of U. S. Under the sixth five-year plan (1956-1960) Soviet policy is: "Mechanization must be speeded up considerably and industrial production methods must be automated on a large scale."

The sixth 5-year plan was abandoned because it was too optimistic but the mechanization drive continues unabated.

The American steel companies, and others who recently spent a month touring Soviet steel mills, research centers and ore mines, picked up a $10,000 tab as a goodwill gesgesture—they hope that by this and other reciprocal visits the word will get through to Ivan, the man on the street in Moscow.

Ivan, incidentally, spends a lot of time on the street after work because his living quarters are miserably overcrowded.

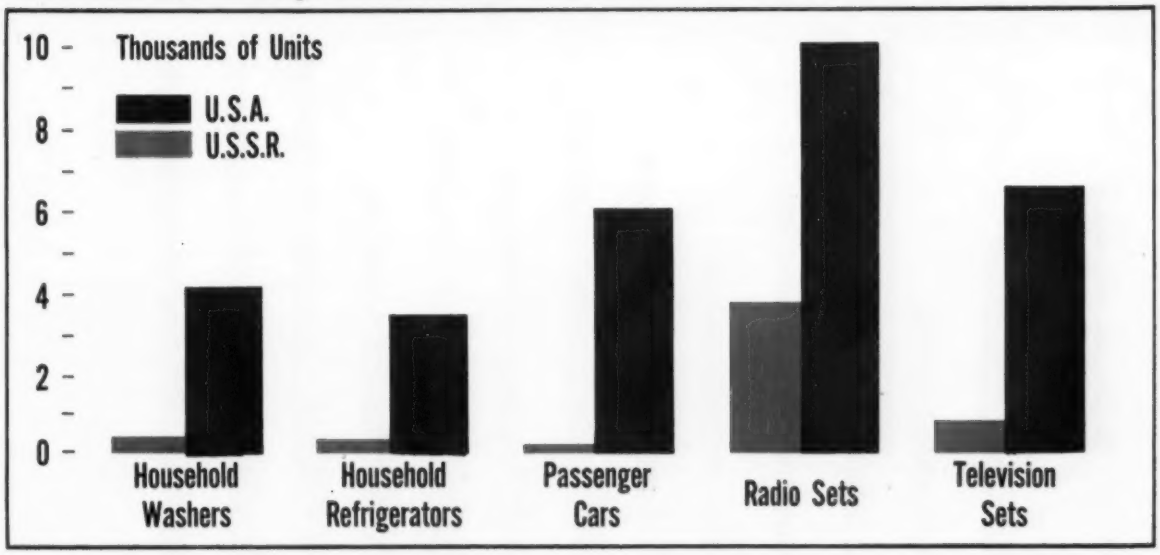
New apartment buildings look as though they had been put up in a mad rush—which in fact they were. Crews are working day and night on scores of huge, six to eleven-story apartments in an all-out effort to ease Moscow's desperate housing shortage.

Russia's industrialization drive was relaxed a bit last year in favor of a little more emphasis on consumer goods. The latter are still very scarce and, except for radios and television sets essential for indoctrination, are frightfully expensive. Even the TV set is not cheap (six weeks' pay for a skilled ladle crane operator—and it's a seven-in. screen).

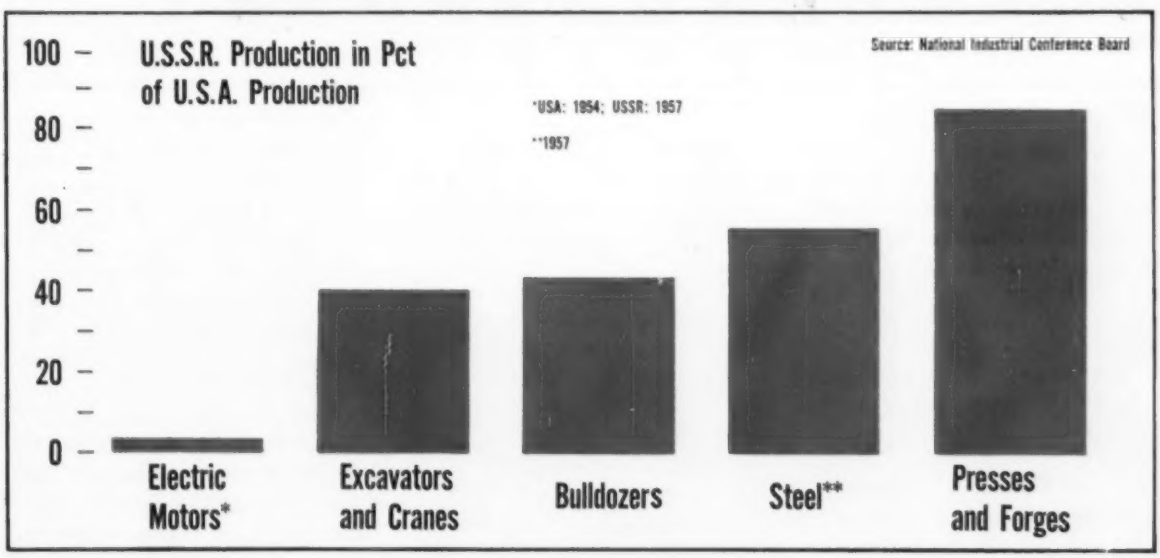
Russian Exports—The USSR is now exporting steel, aluminum, copper, lead, tin, zinc, ferromanganese and other metals. She is shipping steel plant equipment to India and making overtures for other capital goods exports. Export data and nonferrous metals production figures seem to be unobtainable, so no current trend can be plotted.

The Russians say they produced some 125,000 machine tools last

U.S. Outproduces USSR in Consumer Goods



. . But Soviets Are Pushing Capital Goods

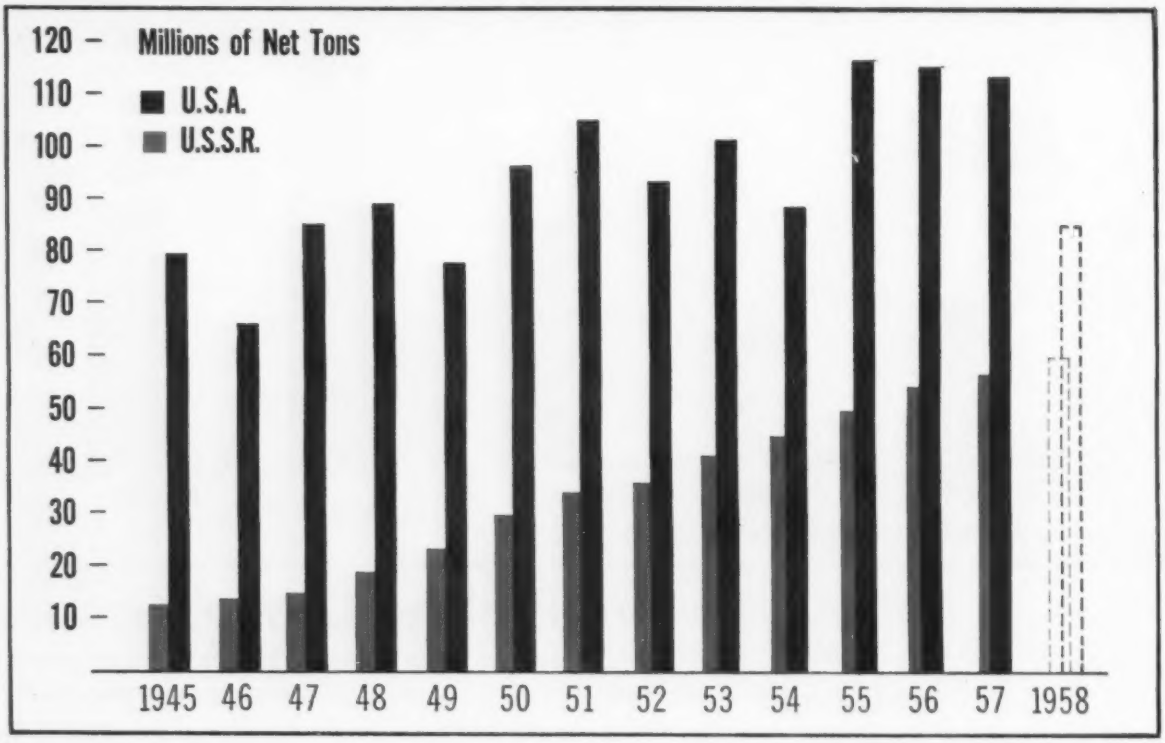


. . . And Don't Forget the Satellites

Russia	Date	Size	Orbit
Sputnik I	Oct. 4, 1957	184 lb	138– 598 mi
Sputnik II	Nov. 3, 1957	1120 lb	132–1009 mi
Sputnik III	May 15, 1958	2925 lb	143–1181 mi
United States			
Explorer I	Jan. 31, 1958	30.8 lb	224–1573 mi
Vanguard I	March 17, 1958	3.25 lb	404–2465 mi
Explorer III	March 26, 1958	31.0 lb	118–1740 mi

Source: National Academy of Sciences

Russia Gains in Steel Output



year but data on sizes and types is not available. The figure is therefore not comparable with the U. S.'s 80,000 in 1957 because the amount of simple lathes and drill presses in the USSR total is not known. Still, by its very size, the figure is impressive.

The threat of the Soviet Union cannot be overestimated merely because all of its current and planned production could well go into a moderate increase in living standards. Housing, railroads, etc. could use much more than the 60 million net tons of ingots the Soviets expect to produce this year.

The point is that the Kremlin will decide export policy just as efficiently and decisively as it does on where and when to buy. (Example: The principal product of the new Republic of Ghana is cocoa. World-wide collapse in cocoa prices threatened revenues just as that new country was coming into being. The Russians sent in five freighters, loaded five cargoes of cocoa and made a friend.)

Hope For Peace — Perhaps the most likely direction in which we could hope for peace in the future would be in a general and strongly expressed desire for more of the creature comforts on the part of Russian workers—from accountants and bookkeepers through crane operators to X-ray technicians. When you realize how low their living standards are now you can see how much metal would be chewed up internally in raising it toward that of the United States. This effort to make a real improvement in housing and slightly to increase consumer goods and perhaps some luxuries, could upset the heavy industry timetables and the whole economy.

Since steel is a priority industry, the average steelworker gets about 1000-1100 rubles a month. (See chart for specific rates.)

What is a ruble worth? The official exchange rate is four to the dollar; tourists get 10 per dollar. Neither figure can be used in comparing wages and prices but the chart, "Prices in USSR," shows how long a 1000 - ruble - a - month man must work to buy some key items.

Taxes are low, those at minimum wages pay none; the average rate is 5 pct and the top rate is 13 pct. This sounds like a "dirty capitalist trick" because taxes are not essential to the government's income.

Since the government owns all land and sources of production the job of budget balancing is simply this: The Kremlin figures what it needs to produce the goods and run the government and then sets selling prices at enough above costs to take in this amount. So, in effect, the Kremlin gets a cut of whatever Ivan buys, whether you call it taxes or part of selling prices.

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U.S. Visitors Get Close Look At Russian Steel Plants

Data gained by an American group touring Russian steel plants will shed new light on the performance of Soviet steelmaking facilities.

Teams of specialists looked into all areas of steel production. Here is what they saw in the plants they visited.—By G. F. Sullivan, Editor.

▪ Copenhagen — The first United States delegation to visit Russian steel plants under the recent U. S. —U.S.S.R. exchange agreement is this week winding up a one-month tour of Russia with data that will shed new light on that nation's steel industry.

Because of its size—19 men—the delegation was able to split up into teams of specialists to probe mining, sintering, coke ovens and blast furnaces, openhearths, electric furnaces and rolling mills, labor and economics. It is the first Western group to be permitted as far into Siberia as Stalinsk, site of a large modern steel mill.

Chief of the delegation is Edward L. Ryerson, a director and former head of Inland Steel Co. Deputy Chief is John A. Stephens, U. S. Steel vice president and famed labor negotiator. Others in the group include specialists in all phases of steelmaking.

Check Wage Rates—The American Iron and Steel Institute organized the trip under the exchange agreement plan. The group's report will confirm and amplify some previous information and develop considerably more data than has been available formerly on the advanced state of Russian iron and steelmaking.

The group also studied how the Russians use oxygen in steelmaking; checked the extent of their use of continuous casting; determined wage rates in steel; and studied the Soviet system of incentives for labor and management.

Based on its investigations, there should no longer be any doubt about performance reports on Soviet steel facilities. It made exhaustive studies of furnace size and construction details, raw materials and iron and steel production by individual furnaces and entire plants.

Frank Answers—The American technical experts often asked for and were shown blueprints of machinery and plant layout drawings. Some climbed atop openhearth furnaces to study roof construction. Others went through ore sintering plants from top to bottom.

Probably no other Western group has seen as many plants in as much detail. General superintendents of plants (the Russians call them directors) were questioned for hours. Their replies on technical details were apparently quite complete and frank. Where interpreters might be misunderstood the area in question could be studied further in detail in the plant.

No Junket—The trip on which this reporter was attached to the

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This article represents the views of Mr. Sullivan who has just completed a tour of USSR steel centers with a group of other Americans. Additional reports will be published as conditions permit.

IRON AGE Editor at the Kremlin

U. S. DELEGATES: Red Square and the Kremlin Towers provide background for four members of American steel and iron ore delegation in Moscow. Left to right, they are: E. L. Ryerson, chief of the delegation and a director of Joseph T. Ryerson & Son and of Inland Steel Co.; G. F. Sullivan, editor, THE IRON AGE; M. O. Holowaty, chief research engineer—raw materials, Inland Steel Co.; and F. S. Eckhardt, asst. general manager, Lackawanna Plant, Bethlehem Steel.

ARRIVAL IN MOSCOW: E. L. Ryerson, right, chief of the delegation, preceded the group to Moscow. Here he greets Col. M. R. Thompson, American Iron & Steel Institute, at the airport.

RED SQUARE VISITORS: Shown as group took a brief Moscow tour, are U. S. Steel's S. M. Jenks, vice president for central operations (steel and coal), left, and Prof. M. G. Clark of Cornell Univ.

iron and steel delegation for 3 weeks was not a junket. In that time there was only one nonworking day—a Sunday. The steel group covered 2,700 miles in Russia's 500-mph commercial jet the TU 104. Another 2,500 miles were aboard Russia's other commercial airliner, the Ilyushin, a 21- to 25-seat twin-engined ship. It put in another 600 miles aboard chartered planes similar to the DC-3 and another 850 miles on trains.

The mining group travelled farther. One member made a 20-hour round trip in a special car attached to an ore train in Siberia.

Because of the fast pace at which the groups worked, and the fact that all but a few evenings were taken up either by receptions or aboard planes, the delegation has not yet been able to compare, reconcile and compile its notes. It plans to issue a fully documented report in the near future.

Explore Big Mill—Among the mills visited were Magnitogorsk in Siberia. It is among the world's largest, made 6.6 million net tons of ingots last year. Also included were Chelyabinsk in the Urals which makes stainless and electrical steels. There a huge blast furnace, designed to produce 3,000 net tons per day, is being erected by Komsomol Young Communist League workers in what they expect will be record time.

Two steel plants were inspected in Zaporozhye, scene of almost total destruction in World War II. Here the Russians make much of their bearing steels and tool steels. Two days were spent going through the Kuznetsk works at Stalinsk, Siberia, the first Western group to see this plant since 1932 when an American firm designed and supervised its construction. It has since been enlarged and modernized.

In Siberia, as elsewhere in the Soviet Union outside metropolitan Moscow, the American delegation was the object of much curiosity. It was a friendly interest. There was not a single case of animosity shown in any of the crowds that gathered inside and outside of plants and on the streets along the way.

Russians Will Return Visit—The Russian people have a genuine desire for peace. The desire is intense and apparently almost universal. The Russian people are almost invariably surprised to learn that the Americans have no aggressive intentions. They ask why the United States has surrounded them with atomic bases.

A Russian steel delegation will soon return the visit as part of the exchange agreement. The hope in Washington is that part of the purpose of these missions will be achieved by person to person contacts, even though they are on a very limited scale. It would be a sad thing, in this writer's opinion, if America failed to receive the Soviet delegation as individuals in as friendly a fashion as this group was received in the Soviet Union.

We have no quarrel with the people of Russian. The sooner we convey that fact to all of Russia the better our chances of avoiding a shooting war. This would tend to limit competition to the economic sphere—which is another subject in itself.

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Warehouses Grow Despite Slump

Industry's Annual Capital Outlays Hit $20 Million

In the face of slow business, this industry is still expansion-minded.

Growing importance in steel distribution picture is a factor. —By K. W. Bennett.

▪ Steel warehouses are a Grade-A choice as the major exception to the slowdown in capital expansion expected for most U. S. industry in the 1958-1960 period.

A. M. Castle has just moved into the Cleveland area, taking over a $1,500,000 plant. Jones & Laughlin Steel Warehouse Division will open a 100,000 sq ft plant at Louisville, Ky., in October. Joseph T. Ryerson & Son this week is showing its new 80,000 sq ft plant at Indianapolis; and is operating another new plant of about the same footage at Charlotte, N.C.

Spending Plans — It's estimated that industrial steel warehouse capital outlays are running at $20 million per year. Despite gloomy talk of sharp cuts in 1958 spending, warehouses will earmark at least this amount in 1959. At that point, they'll begin thinking about the expected boom in business generally that's been predicted for the mid-1960's. It's safe to assume that the square footage of warehouse space, estimated at 36-37 million sq ft at the moment, will be up by another 1 million square feet at this time in 1959.

Thus far, 1958 has been no year to encourage expansion. From over seven million tons of steel received from mills in 1957, the industry dropped to a 5-6 million ton forecast for 1958. Turnover rate, historically running about 2.5 turns per year for the industry, fell to a three-quarter turn per year rate in second quarter.

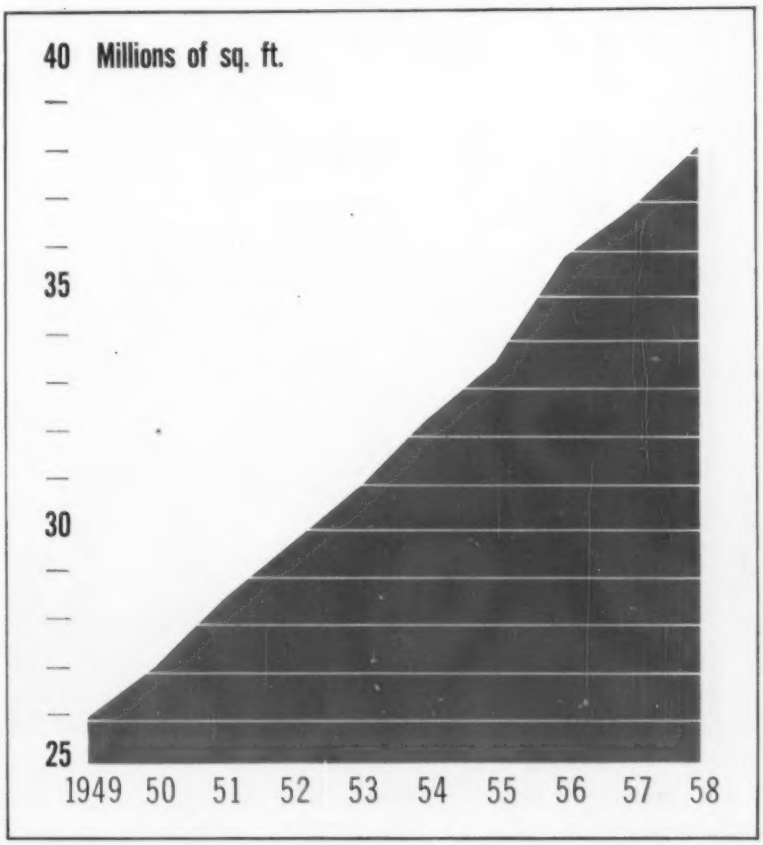
A Big Business—Industrial steel warehouses account for about one-half the total steel marketed through distributors. Building supply and oil country warehouses, and other specialty distributors consume the balance. In record 1956, industrial steel warehouses took 9,245,532 tons from mills. Warehouses of all types purchased 16,752,233 tons, or a total of 20 pct of mill output. But in 1957, and thus far in 1958, the entire industry has suffered a heavy business drop.

Why warehouse expansion? It's pointed out that the industry is at 60 pct of capacity. As of June, warehouses have about 3,700,000 tons of steel in inventory, just about the ideal amount for the amount of warehouse space available. But expansion is continuing. Here's why:

Why Industry Expands—Warehouse steel sales, like steel industry sales, have a healthy long-range growth curve. Most forecasters figure about 3.5 to 3.9 pct per year. This is conservative. Average annual gain in the post-war decade has been over 5 pct, or more than

Steel Warehouses Grow

Sq. Footage, Steel Warehouse Space



one-half million tons per year. In the hardrock 1930's, the tonnage growth was smaller, but the growth rate averaged better than 10 pct through our worst depression decade.

Warehouses distribute a little more of total steel output per year. The average steel mill, turning to longer rolling cycles and more continuous mills to beat advancing labor costs, is content to turn more of its small package business over to the warehouse industry. Percentage of the total steel output marketed through distributors has inched up at a 0.2 to 0.3 pct per year rate.

More And More Service—Warehouses must continue to function as a standby reserve of quick-delivery steel when mill schedules tighten. When the steel mill operating rate passes 85 pct, they've got to be ready for a rush of emergency orders. These can boost total warehouse volume by 25 pct. Some veterans say 25 pct is too low a figure, that sales will climp 30 pct over normal business levels when over-all steel supply tightens.

The number of services offered by the warehouse, or Steel Service Center, is up, and climbing. (The IRON AGE, Nov. 28, '57, p. 44). In the 1930's, about 10 pct of warehouse orders required cutting, shearing, slitting, or other processing. In the 1950's, the figure is 50-60 pct. Educated guesses put the percentage at 80-90 pct within five years. Spelled out in terms of capital equipment requirements, one highly mechanized warehouse will spend as much money on processing equipment in 1958 as it did in 1957. The tentative 1959 forecast is for the same amount. This is exclusive of outlays for buildings.

Growing Product List — Warehouses must carry wider stocks. General line steel warehouses now carry aluminum, plastic, stainless, machinery, free machining steels, in greater quantity and a jungle of sizes and finishes. To this list may be added expanded metal, metal panels, tank heads, and fabricated steel parts.

The net effect has been to push warehouse footage up at an average 1.4 million sq ft per year for eight years. It's believed this will fall to 1 million sq ft in the future, for two reasons: (1) The industry will push for a 3-3.5 annual turnover by the 1960's. (2) The continuing move to pile stocks higher, up to 21 ft in existing space will also cancel off some floor space additions.

Plans in the Works—Warehousemen aren't making much noise about expansion. But the plans are made, and the budget is being stretched. A supercharged situation has been developing that could, as it did in January, 1955, touch off an even stronger expansion push.

Early forecasts had indicated a severe dropoff in July warehouse sales. And plans for July purchases from the mills were scaled down accordingly. But warehouse surplus stocks have skinned down at amazing speed.

Buy or Sit Tight?—The argument shaping up behind closed doors: Do we increase our planned July purchases, and take a chance on overloading our inventory again? Or do we put off buying and risk running out of steel if business holds good?

Within the past week, a few wary steel buyers in the warehouse industry have placed orders as far in advance as September for selected steel grades. The majority are holding back. One has boosted buying plans for July to tonnages that will exceed the June intake.

SPEED AND ACCURACY: The modern steel warehouse is more than just a distributor of metals. It performs many services, uses up-to-date and efficient equipment. Like this flame cutter at a Joseph T. Ryerson plant.

CLEVELAND SCENE: Some of the 14,500 visitors at the Materials Handling Show appraise new equipment.

Can Distribution Go Automatic?

Material handling men are aiming at a big, untapped market—distribution.

It was a main point of discussion at the 1958 Materials Handling show.—By T. M. Rohan.

■ The ultimate purpose of the $5 million worth of equipment displayed at the 1958 Materials Handling Conference in Cleveland was summed up neatly by a New York systems engineer:

"What the distribution field needs," said Allan Harvey, "is a total system concept. We need to shake ourselves loose from the engineering concepts that are a hangover from the time we didn't have tools."

Automotive Example—Mr. Harvey, a partner in Dasol Corp., systems engineering consultants, said the distribution industry could take a page out of the automotive industry's book. The engineering approach started by Henry Ford linked together bits of equipment into a continuous operation, he pointed out. It achieved fantastic production efficiencies as automatic machines became available.

"Many of the gains we have achieved in production we have lost in materials handling, paperwork, and other non-productive functions," Mr. Harvey told the materials handling men. While we are saving pennies in engineering and production, we are wasting dollars in these non-productive functions, he said.

Costs Too High—"The distribution phases of manufacturing have lagged far behind production improvements and are eating up a totally disproportionate share of our gross national product.

"Studies we have made indicate that in a variety of commodities, the cost of getting goods from the factory to the consumer ranges from 25 to 52 pct of the selling price. This makes no engineering sense," he added.

Studies made by his firm also show that in conventional warehouses now, only 15 to 40 pct of man-hours are spent in productive work. The rest is in walking, toting, and thousands of varieties of minor decision-making which could be done with simple, automatic control.

"Our warehouses are bedeviled by peaks and valleys, by overtime, by errors, and the familiar high costs and customer complaints," he said.

New Equipment — The trend toward more elaborate electronic control and instrumentation was evident in the equipment on display throughout the show.

Building Boom a Bust For Steel

Trouble is that uptrend is in areas that do not use heavy tonnages of steel.

Industrial construction is off. User inventories also a factor. —By G. J. McManus.

▪ Industry's number one vanishing act is getting no applause from steel mills or structural fabricators.

"Where are the construction dollars going?" they ask glumly.

They read that construction is running ahead of last year with more than $17 billion worth of completions so far. They hear the government is pumping $6.2 billion construction dollars into the economy and is about to up the rate by $1 billion.

The Bad News — At the same time, steel mills and fabricators see a sharp drop in their own building business. Shipments of steel to the construction industry are down by nearly 40 pct from last year.

Shipments of fabricated structurals were down 4 pct over the first four months and 11 pct in April. Bookings of structural fabricators are off 40-50 pct from last year.

Why are two key suppliers slumping when construction continues at a boom rate? Where is the money going?

Big Users Lag — Part of the answer is that much of the current spending is for types of construction that take relatively little steel. Housing and highway construction are up; neither field is a big steel user. The biggest steel users are factories and gas pipelines. Both are down from last year.

There are many other factors. For steel mills, inventories have probably made the biggest difference. Last year builders bought 26.5 million tons of steel and used only about 24 million tons. The inventory buildup of 2.5 million tons is now being liquidated.

Inventory Cuts — Builders will probably slash about 2 million tons from their steel stocks this year, with most of the cutback coming in the first three quarters.

Another element is the timing of contracts. Shipments of structural fabricators for the first four months were only about 50,000 tons under the same period last year. Their big headache is that new business has not been coming in at a satisfactory rate. At the end of March their backlogs were down 40 pct from last year and more than half of the work remaining was due for completion by the end of July.

Pencil Sharpening—This condition brought the competitive bidding that is cutting the hearts out of fabricators. They are taking jobs at cost or less. They are eliminating escalation clauses (one reason why hedge buying has been heavy).

Construction No Help to Steel

Shipments Through April-Net Tons

Product	1957	1958	Pct of Change
Heavy Structural Shapes	2,251,616	1,308,919	Down 41
Plates	3,297,082	1,843,980	Down 44
Reinforcing Bars	913,602	541,570	Down 41
Nails and Staples	158,368	130,270	Down 18
Galvanized Sheets	846,365	756,813	Down 9
Piling	202,189	128,141	Down 36

Source: AISI

The reason for the lag in new work is that general contracts fell off sharply toward the end of last year. This lag showed up in scarcity of new jobs for fabricators this year. Trade sources say general contracts have been climbing steadily since January and that there was a strong spurt in May carrying over into June.

Better Times Ahead—As contracts reach the job stage in the second half, there will be more business for steel mills and for fabricators. But there probably won't be enough of the right kind of business to restore either group to 1957 levels.

Highway spending is running 6 pct over 1957 and the government will boost roadbuilding funds by $600 million after June 30. But highways take only 520 tons of steel per $1 million spent.

Homebuilding Spurt — Homebuilding is up slightly from last year with increased public housing providing the gain. Here, again, steel consumption is low. For every $1 million spent on housing, only 175 tons of steel are used.

The most painful blow for steel mills this year was the slowdown in pipeline construction. For every million spent on gas transmission, 3600 tons of steel are sold. Shipments of steel to pipeline operator are now 500,000 tons behind last year. By the end of the year, the loss is expected to be at least 1 million tons.

Industrial Slump — The other critical loss comes in industrial construction, which is currently down more than 20 pct from last year. For every $1 million spent on plant construction, 1550 tons of steel are bought. Cutbacks in factory construction will knock about 850,000 tons off steel shipments for industrial building this year.

Slow Year—All in all, the construction industry is expected to use about 22.7 million tons of steel this year, or 1.3 million tons less than in 1957.

GOING UP: Open web welded Macomber joists lock into place not unlike sides of a bedstead. Ohio firm is bucking recession trend successfully.

Company Innovations Help Beat Slump

▪ An Ohio construction firm is capitalizing on its own roll-formed custom built steel framing to pull itself out of the doldrums that afflict steel construction generally.

Macomber, Inc., Canton, O., is one of the 10 largest building firms in the U. S. It has bounced back from its worst sales month in recent history in February to its best in April, now hopes for better sales this year than last.

Made to Order—"This type of market is made to order for products like ours which have considerable cost-saving features," says Stanley Macomber, company chairman. "People are looking more closely at the building features a dollar will buy.

"The weight saving of cold-roll-formed structurals has been known for years, but it is only now coming into wide usage. We feel it will radically change the light steel construction industry in the next few years."

It also is a boost for some pioneer work done by Macomber in open wet joists, structural parts roll-formed from strip, and other engineering innovations.

Special Shape—The majority of structurals at Macomber are made from strip cold-roll-formed into a special shape patented by the company. Strip up to the heaviest weights is formed this way.

Equally significant, the two lips make it nailable so that boards or other surfaces can be quickly fastened to the beam with a spiral nail.

The company has engaged heavily in research and development since its founding in 1923. Currently, research work is being conducted in cooperation with an American steel mill.

Will Coiled Tinplate Pay Off?

American Can Bets $31 Million That It Will

Can industry speculates if investment in coil processing equipment will show savings.

American now has five of a total of eight plants processing coil.—By K. W. Bennett.

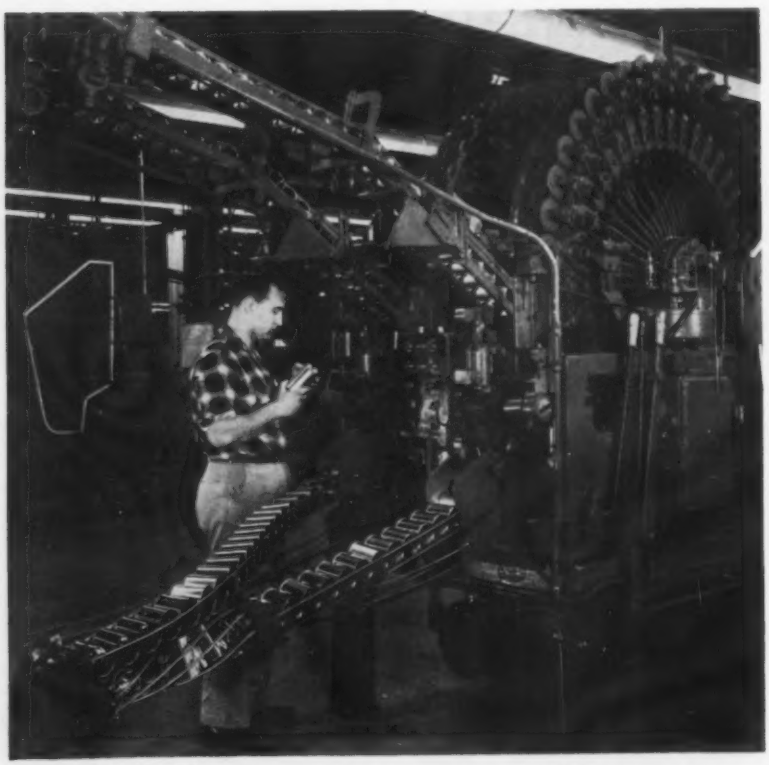
▪ The economics behind American Can Co.'s big switch to continuous coil tinplate have stirred up the entire canmaking industry.

The issue is whether American Can's $31 million program to provide eight coil-processing plants throughout the U. S. can create savings sufficient to write off the cost of the program in a reasonable time.

New Plant—Last week American Can's newest and biggest plant for processing continuous coil tinplate, a product that is only a year old, went into action at Hammond, Ind.

The new plant can sheer, gage, inspect and stack 600,000 tons of tinplate and blackplate a year at speeds of 600 fpm on nine cutting lines and one blackplate processing line.

The fifth of eight plants to be built in American Can's $31 million program cuts the coils of tinplate into sheets from which cans are formed. Altogether, they will meet 80 to 85 pct of American's cut sheet requirements, suggesting a capacity of over 1.6 million tons of coil-cut-to-sheet per year.



TESTING: Machines like this at American Can Co. plant test out 450 cans per minute. It's part of the whole process that will produce a total of 45 billion cans this year, according to American estimates.

Cost Comparison—The immediate reason behind American Can's push to coil, rather than the traditional mill-cut tinplate sheet, is its lower price. A coil costs roughly $60 less than the five 3000-lb bundles of mill-cut sheet it replaces.

This represents an approximate savings of 35 to 36 cents per base box for the tinplate buyer. Using the can industry's common denominator, the familiar No. 2 can that appears in the neighborhood supermarket, the savings represent about one-tenth of one cent per can, assuming 400 No. 2 cans to the base box.

Price Critic — William Stolk, American Can's president, has been a consistent critic of tinplate prices. American has stated flatly that it is in a cost-price squeeze and that using home-processed coil is part of the answer.

However, Continental Can's Gen. Lucius Clay remarked at a stockholder's meeting that his company still regarded coil economics as questionable. Another argument: Maybe the money should be put into new canmaking machines, not coil shearing lines. Nonetheless, other canmakers are experimenting and watching American Can's lead closely.

Other Factors — American's sweep into coil has longer range implications. It's well known that American foresees the day when the enamel liner for food and beverage cans be put on the coiled tinplate, another cost reduction.

Besides the basic price cut, American Can's Mr. Stolk has added these cost-cutters: 1. Close tolerance and scroll end cutting on his shear lines will reduce scrap loss; 2. Tinplate can be salvaged that normally would be discarded by the mills.

LUNCH TIME: One of six batteries of food vending machines for in-plant feeding at Wheeling Steel plant.

Metalworking Takes to Vending

Increase in vending machines has double significance to the metalworking industry.

It means a growing market for parts and materials. But vending machines are also gaining as a service.—By G. G. Carr.

• Vending machine builders have found almost no limit to the range of products that can be sold in their ever-present coin-catchers.

Total dollar volume of vended products has leaped from $600 million in 1946 to over $2 billion in 1957.

Vending machine builders form a significant metalworking market. National Automatic Merchandising Assn. reports that 157 manufacturers turned out 430,000 machines in 1957. And this figure should jump substantially over the next few years.

Parts and Materials—Metal use is hefty. Fabricated metal products used in the machines range from alarm systems to motors to waste receptacles. The Vendo Co., a leading builder, chews up about 700 tons of steel in a normal month. The company also buys about 1400 tons of metal parts and components from suppliers each month. Machine cabinets have been made mainly from carbon steel, but there is growing use of stainless and aluminum.

Metalworking machinery in builders' plants includes most standard types, with emphasis on presses and forming equipment. Processes are at least semi-automated wherever possible, and this trend is growing.

They're Versatile — Goods and services vended by the machines cover an amazingly wide range. But the big items are confections, cigarettes, soft drinks, coffee, ice cream, milk and canned foods.

Versatility of the machines is remarkable. One basic machine can vend perhaps a half-dozen products with little if any adjustment. Limitations are those of practicality, and, most important, merchandising effectiveness.

Easy on Management — Special advantages of vending machines for in-plant feeding against cafeterias and lunch carts are said to include ease, speed and availability, plus little if any cost to management.

Vending installations at Wheeling Steel Corp., Steubenville, O., plant are a good example. After trying various methods of employee feeding, Wheeling in 1956 standardized on six installations of 16 machines each. Included in each location are two hot food machines.

Wheeling's contribution was principally providing space and laying concrete pads over dirt floors to accommodate the machines.

Beryllium Looks to Wider Uses

But More Wrought Development is Needed

Beryllium Corp. tells its story to over 100 fabricators and engineers.

The company has more metal to sell, but few know how to work it.

▪ Beryllium metal is about ready to widen its markets, says Beryllium Corp., Reading, Pa.

But there is a major stumbling block. While producers have done extensive work from ore processing to semi-finished shapes, little is known about working and fabricating.

Help Needed—As a step in this direction, Beryllium Corp. invited about 125 fabricators and engineers to hear the beryllium story from its top management and technical people.

Beryllium Corp. is trying to "sell" industry on developing the necessary data for working beryllium because it can no longer afford to go it alone. "No small company can afford to develop a new material by itself," said company president W. R. Lowry.

Supply Improves — Sales vice president L. F. Boland explained that little has been done on wrought beryllium simply because there has been no demand. For nuclear reactors, currently the big market, physical rather than mechanical properties are important.

The company believes now is the time to look into beryllium because of the increased supply of metal available. In 1951, the Atomic Energy Commission contracted for a large amount of beryllium. This had the effect of doubling the industry's capacity. Now AEC needs less, so there is more on the market.

Price Cut in Half—Also, the price has dropped from over $100 per lb in the late 40's to $47 per lb today. Beryllium Corp. says the bottom hasn't been reached. An increase in production volume, as well as technical advances would bring it down further.

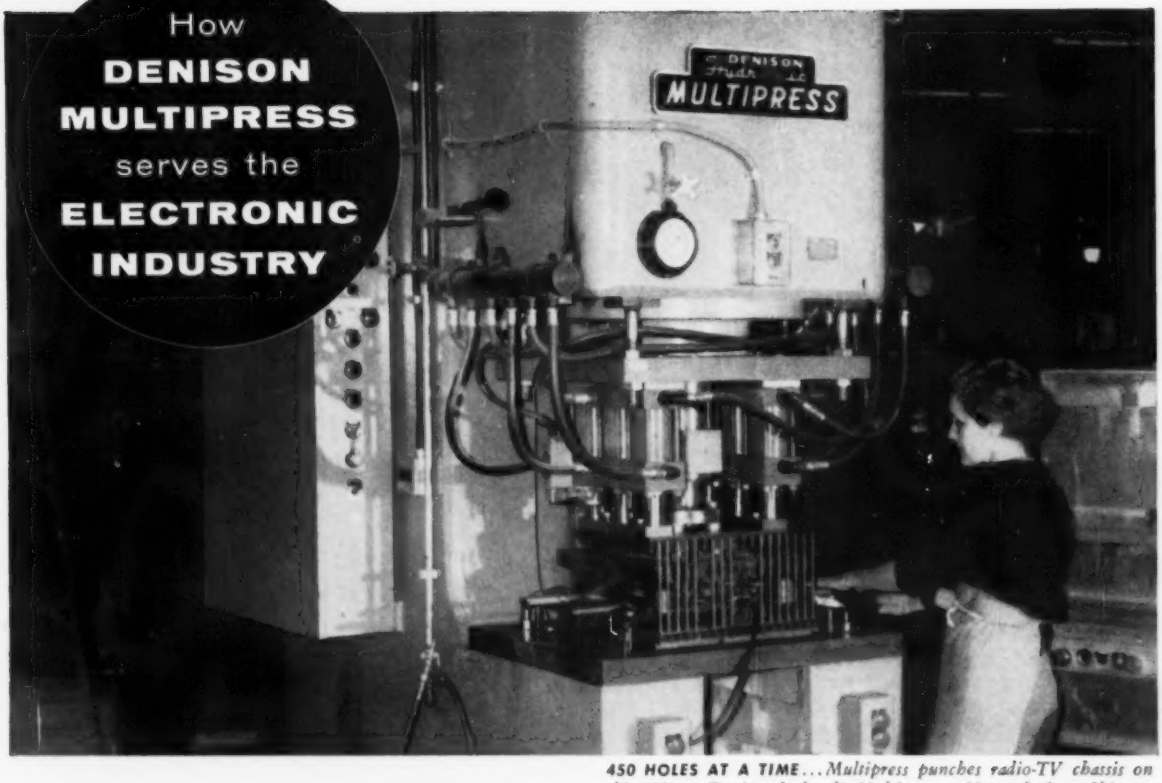
The Air Force has taken an interest in beryllium for structural uses, and has a number of projects planned and in the works that will benefit industry. At Wright Field, it will study and attempt to develop better casting techniques, composite materials, joining methods and to study the effect of surface defects on metal strength. Already being probed are extrusion, forging and sheet rolling of beryllium.

Problems Ahead—Ductility looms as the biggest problem to be overcome. William Santschi, associate director of research, admits beryllium has poor ductility perpendicular to the direction of orientation. This means difficulty in machining as well as rolling.

Advantages — Advantages, enumerated by development engineer E. A. Smith, include low density (about the same as magnesium), high melting point (slightly under steel), top modulus of elasticity, and tensile strength better than most nonferrous metals. In strength-to-weight ratio beryllium exceeds magnesium, aluminum, and stainless.

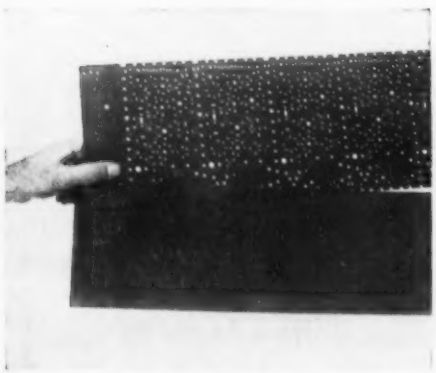
SHAPES: Sales vice president Lawrence Boland points out some advantages of beryllium to attendees of the Beryllium Corp. symposium.

How **DENISON MULTIPRESS** serves the **ELECTRONIC INDUSTRY**



450 HOLES AT A TIME... *Multipress punches radio-TV chassis on this 100-ton Denison hydraulic Multipress at Motorola, Inc., Chicago.*

Precision-punching TV chassis holes faster—450 at a time—at **MOTOROLA** with **DENISON** hydraulic Multipress



RESULTS... *Motorola's plastic chassis bases are punched faster, to precise limits with Denison Multipress.*

At a Motorola plant in Chicago, plated-circuit chassis (designed as a base for radio and TV packaged electronic circuits) are precision-punched faster on a 100-ton Denison hydraulic Multipress.

With one quick, controlled ram stroke, Multipress *punches up to 450 holes at a time* in these plastic chassis boards. And Multipress does the job without shock to exact pre-set pressures... with absolute *control after breakthrough.*

Precision hydraulic control means Multipress *punches holes cleaner, smoother*... affording a uniform plating surface inside each hole. No bulging around holes... no cracking between holes... minimum breakout.

Plus benefits: die life is improved... there's almost no punch breakage... far less scrap loss compared to the former mechanical method which also had high shock and slow punching speed. With its *fast setup,* Multipress handles 15 different dies with *quick changeover* to other full-production jobs.

Endless jobs throughout the electronic and other industries can be done *faster... for less cost* with Denison hydraulic Multipress—from 1 to 100 tons. Ask your Denison production specialist to show you how.

DENISON ENGINEERING DIVISION
American Brake Shoe Co.
1242 Dublin Road • Columbus 16, Ohio

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DENISON HydrOILics

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

New Queen of the Lakes

SPLASH: The 729-ft ore carrier Edmund Fitzgerald, largest ever built on the Great Lakes, is launched in the Detroit River at the Great Lakes Engineering Works. Owned by Northwest Mutual Life Insurance Co., the $8 million craft will be leased to Ogelbay Norton Co. for 25 years.

Freight Excise Repeal Likely

Hopes for an early end to the Federal freight excise tax burdening shippers and carriers are well-founded.

The Senate is especially receptive to pleas for a tax law amendment that would scrap the 3 pct levy on freight movements. An estimated half of the 96 senators favor tax relief in this form, now that no general tax reduction is planned.

Emergency Gone—Broad impact of the freight excise makes its repeal an attractive goal this year. Producers, shippers, transporters, and consumers all are affected by the wartime-imposed levy. With millions of votes at stake this fall, the lawmakers are more responsive than ever to the arguments for a measure of tax relief.

In World War II the transportation tax was regarded as a useful means of conserving carrier space for defense shipments. But the "emergency" tax, the Senate realizes, has become an economic drag.

A second purpose of the tax, the providing of federal revenue, is still achieved to some extent. Returns from the 3 pct levy in the last complete government year came to $468 million. That amount in itself might be judged a sufficient reason for keeping the tax.

However, a strong argument is made in Capital Hill that the tax defeats itself. Transportation taxes are deductible from income as business expenses. Thus the $468 million is reduced by more than $200 million.

Jobless Pay Voted

Funds to finance the recently-approved federal loan program extending state unemployment compensation programs will be available soon.

Congress has already approved the full $665.7 million fund requested by the President to finance a 50 pct extension in the duration of any state's jobless pay plan which asks for the money.

Of the total, about $640 million would be available for the states to make unemployment payments to jobless workers whose coverage under state plans has expired. The remainder would be used to pay administrative expenses of the U. S. Labor Department and the state unemployment compensation offices to cover the longer payment periods.

Steel Output Climbs

Steel production totaling 6,308,000 net tons during May was the highest since January of this year, according to a preliminary report by the American Iron and Steel Institute.

The May figure compares with 5,532,991 tons of ingots and steel for castings made during April and 9,192,323 tons produced in May last year.

The AISI index of steelmaking for the month was 88.7, compared with 80.4 for April and 137.6 in May, 1957.

Tyson Expands

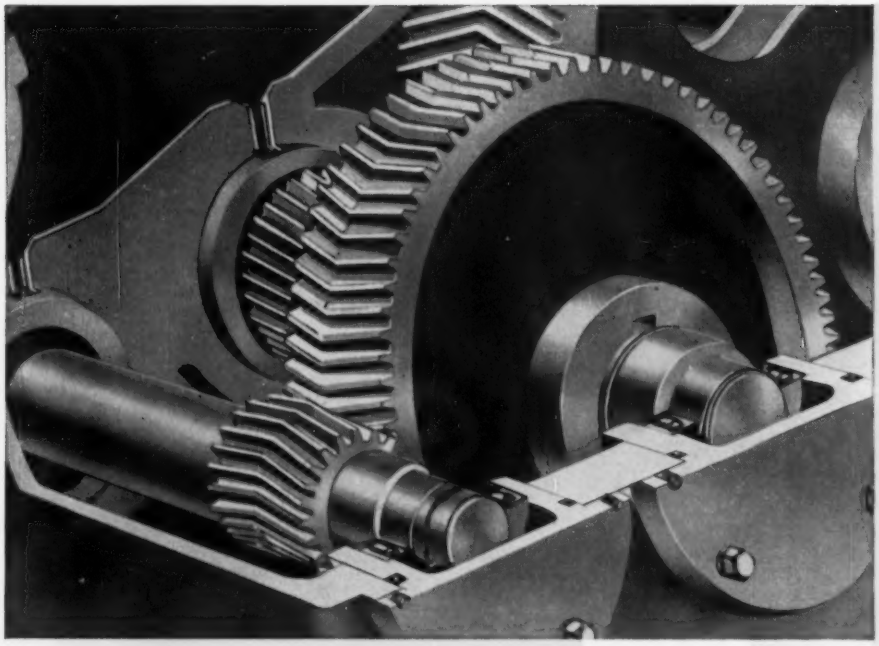
Tyson Bearing Co., Massillon, O., will launch a new expansion program this month, aimed at improving customer service and broadening the line of tapered roller bearings.

The initial phase of the expansion of the division of SKF Industries, Inc., will provide $1,200,000 for new equipment and construction.

United Expands

United Engineering and Foundry Co. will spend $1,750,000 to expand the company's Vandergrift, Pa., plant. The expansion will include extensions to both casting and steel roll finishing buildings.

The proposed expansion provides for additional capacity and facilities for the manufacture of steel rolls and machinery exceeding the size of present requirements.



ALTEN SPEED REDUCERS FROM STOCK

ALTEN SPEED REDUCERS—AGMA RATINGS

	REDUCER DESIGNATION									
	D-6	D-16	D-25	D-40	D-57	D-80	D-114	D-160	D-228	D-320
Ratio	30.3-1	33.2-1	28.4-1	28.4-1	30.9-1	30.5-1	30.9-1	30.3-1	30.1-1	30.0-1
Gearing	Helical				Herringbone					
Thermal Horsepower	11	16	21	34	52	63	81	103	131	187
Horsepower Rating @ 1750 RPM Input	5.8	14.9	24.7	35.4	51.9	63.2	90.2	128.5	180.9	275.9
Peak Torque Rating @ 1750 RPM Input (thousand inch-lbs.)	6.3	17.7	25.2	36.2	57.7	69.4	100.2	140.3	196.1	297.7
Overhung Load Rating Output Shaft Lbs.	950	1250	4000	6800	12600	12600	14300	14500	23400	30800
Shipping Weight Lbs.	200	400	520	860	1580	2250	2400	4200	5150	6350

Heavy-duty Alten speed reducers — herringbone or helical — are designed for hard, continuous use on original equipment or with existing machines. They're in use now on oil field pumping units, dredges, saw mill machinery and other similar applications where unfailing performance is imperative. Alten can deliver from stock. Alten engineers will work with you on special applications to develop the capacity, ratio, reduction, speed, drive and gears that meet your needs best. Write for complete information.

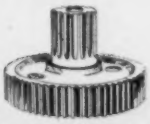
ALTEN

FOUNDRY & MACHINE WORKS, Inc.

DESIGNERS AND BUILDERS OF EQUIPMENT SINCE 1889

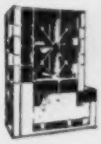
LANCASTER, OHIO

SERVICE TO METALWORKING



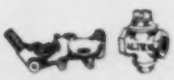
Ductile Iron Castings

Drums and Housings



Beds, Bases and Other Parts for the Machine Tool Industry

Custom-Built Machinery



Hydraulic Pumps and Valves

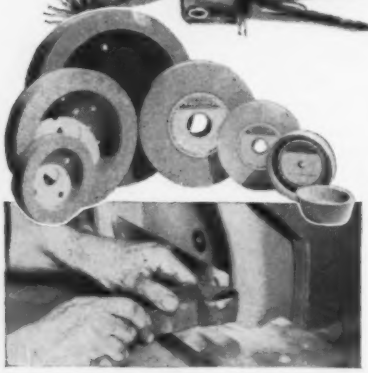
Carbon and Stainless Steel Fabrication, Machined and Unmachined

- Parts or Assemblies
- Gray and Alloy Iron Casting
- Engineering, Production, Inspection

Fishing for carbide grinding economies?

Catch 'em all fast— with the finest lures made

You cut grinding costs to rock bottom with Norton's outstanding wheel selection and service.



Norton K† Bond CRYSTOLON* WHEELS Bring Big Advantages to Offhand Grinding

Here's a combination of vitrified bond and silicon carbide abrasive that delivers remarkable results — particularly in offhand sharpening of single-point carbide tools. Wheels are made in dense, medium, or porous structure — for most efficient action regardless of the area of contact.

Also, CRYSTOLON abrasive is available in green or gray types — green, 39C, being first choice in a majority of carbide applications. And the Norton K Bond is one of the most radically improved vitrified bonds ever developed. One big advantage is: *it assures closest possible duplication of wheel specifications.* Which means that every time you reorder K Bond wheels you get exactly the same top performance.

Norton Diamond Wheels, Mined or Man-Made . . . Carbide Grinding's Certified Crown Jewels

Norton was first to introduce all three bond types of diamond wheels: resinoid, vitrified and metal . . . does all its own checking and sizing of diamonds . . . duplicates wheel specifications with constant accuracy.

The three Norton bonds — resinoid, vitrified and metal — cover the complete range of carbide grinding requirements — from roughing to precision — including sharpening, surfacing and cutting off — on all kinds of work: single-point tools, multi-tooth cutters, form tools, dies, blanks, etc. Resinoid wheels are available in special bond types — B for wet and B6 for dry grinding.

Norton leadership in diamond wheel manufacture continues whether the diamonds used are natural or man-made. And with each Norton diamond wheel you get a certificate of diamond concentration, bearing the signature of the President of this Company.

W-1645

The Complete Line, Completely Serviced

See your Norton Abrasive Engineer or Distributor for expert advice and prompt deliveries on the wheels you need for top quality, lowest cost carbide grinding. Or write to NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries †Patent applied for

NORTON ABRASIVES

Making better products . . . to make your products better

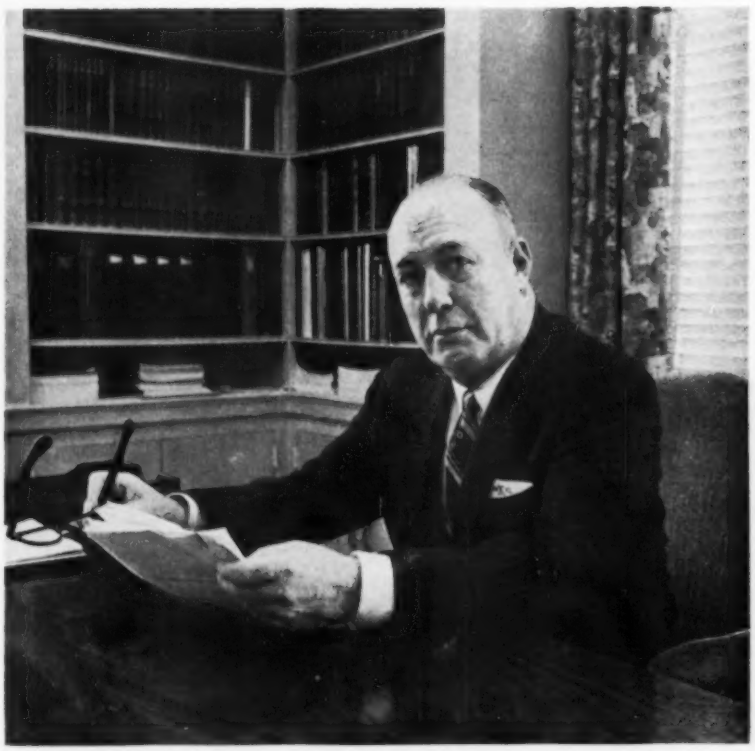
NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

John K. Killmer

The Road Ahead for Steelmaking

Watching industry and market trends and adapting steel to them is a big job.

Mr. Killmer, Bethlehem's head metallurgist, sees no end to the challenges facing steel.



JOHN K. KILLMER: Research and process men must work together.

▪ In 1923 a young man with a metallurgical degree in his hand walked away from graduation exercises at Lehigh University and into Bethlehem Steel Corp.'s "loop course" for college graduates. The steel industry, he was told, offered tremendous challenge to a young engineer.

The young man, John K. Killmer, soon learned it was true. He has since become chief metallurgical engineer at Bethlehem. And the reasons that led him to cast his lot with steelmaking 35 years ago still hold today, he says.

Early Influence—"The young engineer or metallurgist starting in this so-called 'old basic industry' has no ceiling over his head," says Mr. Killmer. "Truly, the challenge and opportunity are there."

Mr. Killmer is a native of Reading, Pa., in the heart of eastern Pennsylvania's foundry belt. He undoubtedly picked up his interest in metals from his early environment. He's had lots of opportunity to exercise his scientific curiosity at Bethlehem.

Serves WPB—He was appointed a contact metallurgist in 1928, covering alloy and tool steel bar products, and drop and heavy forgings. In 1937, he was transferred to the vice president's staff, handling carbon, alloy, and tool steel bars and semi-finished products.

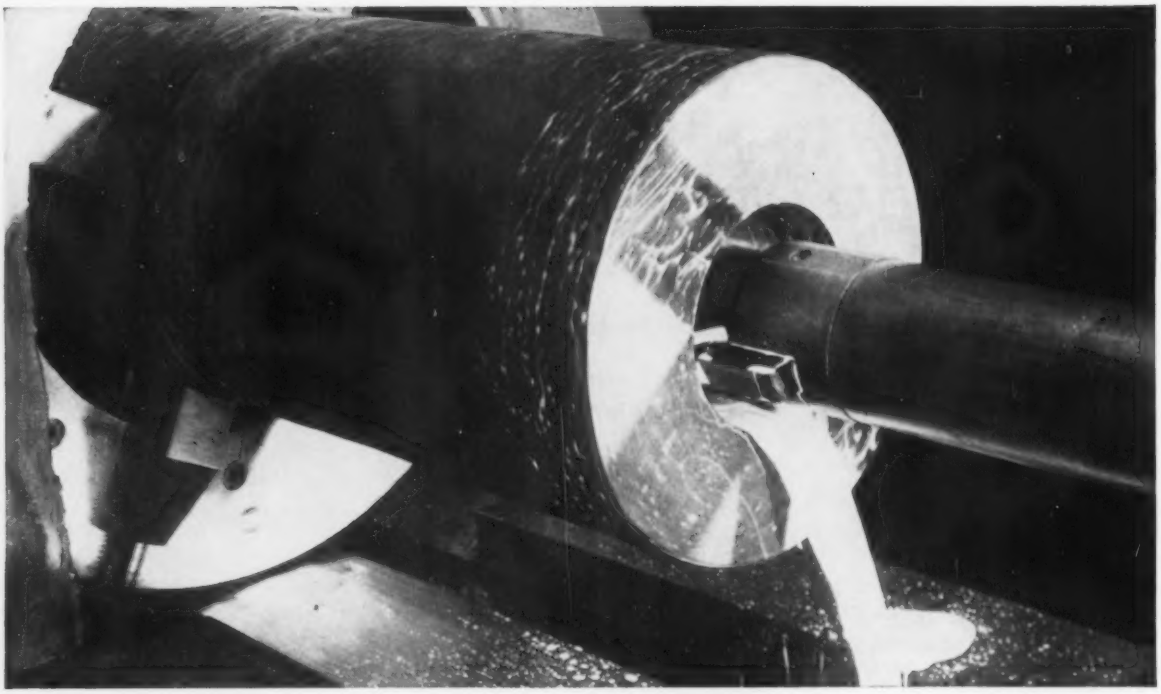
Bethlehem lent him to the War Production Board in 1942. He returned to the company in 1945 and in 1953 was appointed to his present position.

A New Concept—At the start of World War II, Mr. Killmer knew what many people didn't know about the nation's highly-vaunted steel industry: ". . . We not only faced a shortage of raw materials for production of alloys and special steels, but also those necessary for tonnage products," he recalls. "Furthermore, we were short in capacity to produce steel of any type—a condition that also existed during the Korean situation."

These shortages offered a challenge that were ably met by both the steel producer and the consumer. Steels with a leaner alloy content or no alloy at all, responding to improved heat treatment methods and advanced engineering design, resulted in a new concept of steel application, Mr. Killmer explains.

Today's Challenge—"The lessons learned from these periods of shortage have not been forgotten.

What is the old basic industry's most pressing challenge today? Says John Killmer: Research must work hand in hand with the process metallurgist in combatting the influence of higher labor costs and growth of competitive materials.



Finish boring is your first step with Timken® seamless steel tubing —the hole's already there!

YOU save time and money when you make hollow parts with Timken® seamless steel tubing instead of bar stock. You eliminate drilling because the hole's already there. Finish boring is your first production step. With less metal to machine away you get more parts per ton of steel.

And because Timken seamless steel tubing eliminates one boring operation, your screw machine stations are free for other jobs. You get more machining capacity without adding machines.

And you get a better quality finished product with Timken seamless steel tubing because of the way we make it. A solid round is forged over a mandrel, thoroughly working the metal inside and out. This rotary piercing operation gives Timken seamless steel tubing its fine forged quality, uniform spiral grain flow. With exacting control of temperature and piercing speed, we maintain this quality from tube to tube, heat to heat, order to order.

And to further increase your steel savings, Timken Company engineers will be glad to recommend the most economical tube size for your hollow parts job. You'll get a size guaranteed to clean up to your dimensions. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

TRADE-MARK REG. U. S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

Purchasing Policies Take a Turn

You can expect a gradual change from inventory cutbacks to buying for production needs.

Many inventories are at rock bottom, but there's also a strong feeling that the down market is over.

▪ You can expect most companies to take a little more realistic attitude on their purchasing plans in the next few weeks.

While strict inventory measures are still the rule, and will be for some time, purchasing will tend to be more in line with rates of consumption rather than simply being out of the market indefinitely.

Worst Is Over—Part of this gradual change will be caused by the rock-bottom state of many manufacturers' stocks. Many are sadly in need of balancing out their inventories.

But most of the change in attitude will be based on the feeling that the worst is over. Companies will be re-evaluating their present position, determining their needs on their week-to-week or month-to-month business forecasts.

Buying for Need—This will be felt first in raw or unfinished materials. Most of the recent upturn in steel orders has been attributed to price hedging. But a lot of the ordering has been based on actual needs for July and August, not to save a few dollars on the price of steel.

Copper users, for another example, stepped up their buying and actually drove the price of custom smelters copper up to the mill price, then above it. This is the kind of thing that reflects normal buying patterns, not emergency measures.

Psychological Effect — Another factor hinges on that old saying—nobody ever buys on a down market. This is usually associated with volatile commodities, but it carries over psychologically to products that do not fluctuate in price.

But with the feeling that the down market is over, you can expect a reassessment of purchasing policies. Keep a close check on your customers' new orders. Any upturn there should mean potential business for you.

Capital Spending Drop Hurts

The outlook for the second half appears to waver between improved buying for inventory and a better outlook for consumers' durables on the one hand and declining capital spending on the other.

Last week a moderate gain in auto buying and some optimistic reports from the appliance industry were the most encouraging news. Even with lengthy changeovers for new auto models coming up, much better things are expected in the second half.

Revising Downward — But the continued downturn in capital spending has the opposite effect. Furthermore, there is evidence of a trend to revising downward estimates in capital spending as the year progresses.

The Dept. of Commerce and Securities and Exchange Commission survey of capital spending plans tends to confirm further cutbacks in capital spending.

Off 17 Pct — The latest survey showed a 4 pct drop in spending plans for 1958 from the amount anticipated three months earlier. Furthermore, declines in second and third quarters "imply that the decline will extend through the fourth quarter," the survey states.

The survey indicates business will spend $31 billion in new plants and equipment this year, an amount 17 pct less than the record $37 billion in 1957.

All major industry groups except public utilities expect to spend less this year. Manufacturing and mining will spend a full one-quarter less. Anticipated spending for durable goods industries will be down a disappointing 29 pct.

The durable goods group spent over $8 billion on new plants and equipment last year. This year, spending will be down to $5.7 billion.

An even greater drop is expected in railroad spending. Railroads will spend 47 pct less this year.

Consumers Go Slow On Credit Buying

Business may have to adjust to an increasingly conservative attitude on the part of the consumer toward installment credit.

The decline in installment credit that started in February still progresses. Repayments are exceeding extensions, at least through April, when last official figures are available, and probably into May and June.

You can make your own guess as to how much this conservative attitude toward financing is affecting business. But it does indicate that easier credit in itself is not likely to be much of a sales stimulant.

AUTOMOTIVE

GM Foundry Educates Customers

It Pays Off as Creative Selling Tool

Castings Conference at GM's Central Foundry Div. was planned only as a customer service.

But it turned out to be the division's best creative selling tool.—By H. R. Neal.

■ Customer-supplier relationships are often allowed to fall into the sorry state of take it or leave it business practices when a sound program would be beneficial to both parties.

One example of the merits in a sound program can be found in the Casting Design Conference series conducted by General Motors' Central Foundry Div. at Saginaw, Mich.

Selling Tool—Planned only as a customer service program, the conferences have become "one of the most creative selling tools in the experience of Central Foundry," according to James H. Smith, division general manager.

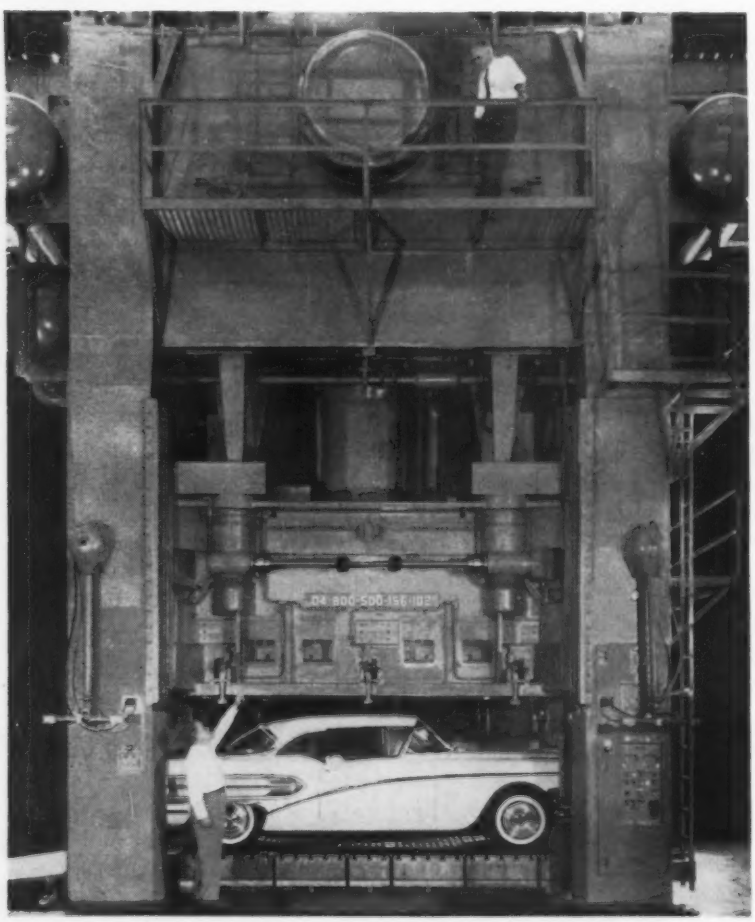
Visitors attending the one-day conferences learn from division executives what's new in materials and techniques as well as ways to realize savings through improved design. The executives start at the beginning with facts about castings, their applications and the casting process.

Latest Developments — Customers and potential customers are shown ways to design castings for bigger savings. They are shown examples of how the use of modern foundry tools—such as stress analysis, Cobalt 60 radiography, sonic testing, shell molding process, new metals and other recent technological advancements—have resulted in vastly improved foundry products.

A tour of Saginaw's Malleable Iron plant is used to demonstrate how these improved techniques are used in practice.

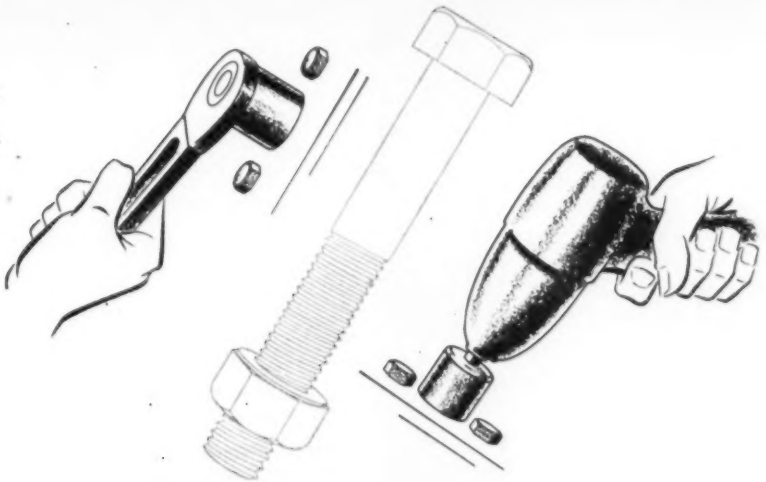
Two Way Benefits—Guests have indicated the conferences have proved valuable to them. Typical is the comment of the director of purchases for a large Detroit firm who wrote: "We feel fortunate to have been included in your Casting Design Conference. We came away with a much better knowledge of casting methods and production facilities. Our people considered the

Stamping in a Big Way



BUICK'S LARGEST: Gigantic press installed at Buick's Flint, Mich. plant weighs nearly 700,000 lb, stands 46 ft high, and exerts 800 tons pressure. At capacity it can press 20 tons of steel roofs an hour.

ECONOMIC FACTS ON FASTENERS



TIGHTEN UP FASTENERS TO TIGHTEN DOWN ON COSTS

- **Too little tightening wastes fasteners' strength—invites failures**
- **Proper application saves on material and production costs**

Go the limit in tightening bolts. You'll find this not only more economical, but safer too. For the strength of a rigid connection depends not on how strong a bolt is, but rather on how much *clamping force* it exerts when tightened.

Example: A bolt good for 20,000 pound load is tightened to just 5,000 pounds tension. Believe it or not, *joint* strength from that bolt would be only 5,000 pounds

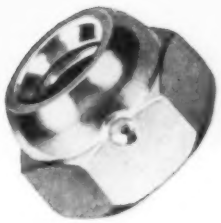
Case History: Earthmover's bucket kept coming loose. Bolts were upgraded progressively, finally to alloy steel and to 1¼-inch size . . . to no avail. Trouble was they still were not being adequately tightened Bigger wrench, more torque and standard ¾" RB&W high tensile bolts stopped problem, saved money.

Obviously, the more of the fastener's strength you use, the smaller it can be. That's why RB&W High Tensile Bolts are such good buys. They have more strength to give. They cost less than the larger machine bolts or bright cap screws they can replace. Moreover, smaller bolts mean smaller holes to drill or tap. Smaller holes can often mean reduction in size of fastened members.

For a penetrating, productive value analysis of your fastening operations, make use of an RB&W Fastener Man. You may be surprised at the cost cutting his experience makes possible. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

RB&W
113th year

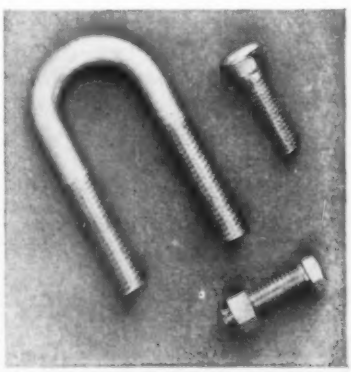
Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**



Economical lock nut

Staking opposite sides of these RB&W acorn nuts deforms threads for a positive grip. It also puts middle of nuts slightly out-of-round, for a spring tension locking effect. They're designed for applications such as outdoor furniture, where anchoring fasteners is more important than solid seating. Available in aluminum, steel, silicon bronze.

These all-metal nuts can also be furnished in double chamfered style. Since they lock with their middle threads, they can be turned onto screw from either side.

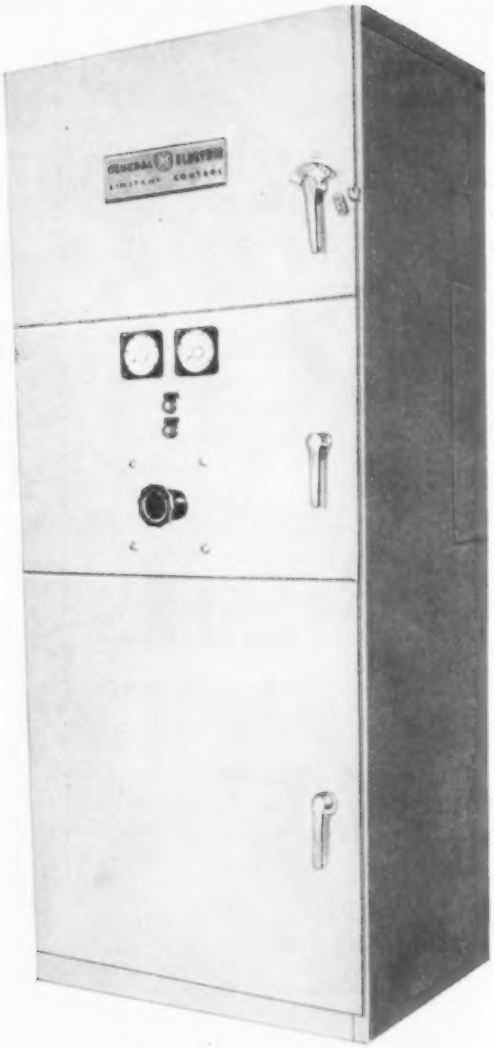


Silicon bronze fasteners combine desirable features

Silicon bronze offers the highest conductivity in fasteners able to withstand high stresses. It resists corrosion, stays free from season cracking, too. It makes ideal fasteners for electrical use where tensile strength is important; or for corrosive environments.

One of the first to develop such fasteners, RB&W cold works them for tensile strength and for clean, well formed threads that don't seize. Oval bolts, hex bolts and nuts, and U bolts available. Specials can be developed.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



G-E LIMITAMP CONTROLLERS offer users coordinated control for high voltage motors, 2300-4600 v, up to 3000 hp. They are ideally suited for the control of squirrel-cage, synchronous, wound-rotor and multi-speed motors on power systems requiring high interrupting capacity for maximum short-circuit protection.

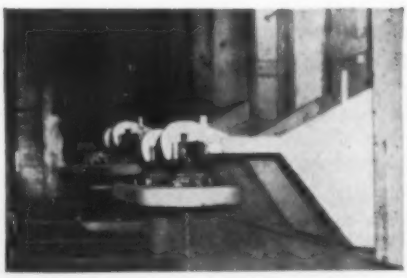
ACP Dip Granodine Process has improved finishes, cut rejects materially on control enclosures

The Industry Control Department of General Electric Company, Roanoke, Va., was looking for an improved method in finishing the steel cabinets and framework for its various control enclosures, such as the Limitamp* panel shown above. An improved prepaint method was needed in order to obtain the high-quality finished paint job required on the enclosures.

General Electric contacted an ACP representative for consultation. He surveyed the operation and at his recommendation ACP Dip GRANODINE 20 was adopted to replace the process in use. The result has been finishes of a clean smooth appearance, besides improved corrosion resistant qualities. In addition, rejects have been materially reduced.

Perhaps you have a similar problem in your finishing department . . . or others that can be solved by using an ACP chemical prepaint treatment. Our application engineers will be glad to help you—feel free to call on us. American Chemical Paint Co., Ambler, Pa.

*Reg. TM of General Electric Co. GRANODINE is a registered trademark of American Chemical Paint Co.



CHEMICAL TREATMENT PROCESSES like ACP Dip GRANODINE 20 used in this Magnus Aja-Lift Automatic Dip Equipment offer improved corrosion resistance, excellent paint adhesion, durable paint finishes.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 20, Pa.

DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

CHEMICALS ACP PROCESSES

New Chemical Horizons for Industry and Agriculture

Automotive Production

WEEK ENDING	CARS	TRUCKS
June 14, 1958	81,983	17,870
June 7, 1958	73,696	16,919
June 15, 1957	125,372	22,748
June 8, 1957	129,517	23,370
TO DATE 1958	2,060,300	410,400
TO DATE 1957	3,126,700	532,500

*Preliminary Source: Ward's Reports

time spent really worthwhile."

But Mr. Smith believes Central Foundry executives gain, too, through the exchange of ideas which takes place at question and answer periods following each presentation during the day, and terms them "extremely beneficial."

Range Widens—Purchasing directors are not the only persons who attend the conferences in force. Although originally aimed at design engineers, Central Foundry's guest list has also included metalworkers from metallurgists and master mechanics up through company presidents. A number of college and high school educators and selected high school students enrolled in industrial art classes have also attended.

Mr. Smith is convinced the conferences have resulted in an improved working relationship between customer engineers and foundry engineers which "is being translated into quality improvement and cost savings."

Central Foundry has concluded its present series of conferences. However, they plan to resume the program this fall if sufficient requests for invitations are received.

What Goes Into A Million V8's?

What does it take to produce 215 million horsepower?

In producing the millionth V8 engine for Plymouth passenger cars at Chrysler Corp.'s Mound Road Engine plant, company statisticians came up with some of the answers.

Materials Rundown—Besides a million engines, it took 33 months. Approximately 59 million lb of aluminum, 300,000 lb of brass, 394.3 million lb of cast iron, 3.8 million lb of alloy steels and 132.4 million lb of carbon steel in addition to 5 million lb of other miscellaneous materials and metals were used. These materials were turned into approximately 750 million parts for the finished engine.

Then, in addition to time and materials, it took a plant with a daily peak capacity of 2500 engines. The plant required 350 machines of various types, a 565-ft long automatic assembly line, 3.5 miles of overheard conveyor system and 20,500 miles of wiring.

Sales Still Lag, But Show Improvement

While May's auto output of 394,474 units was a 10-year low for the month, sales during the period were the highest of any month this year, according to industry sources.

A sales spurt in the last 10 days of the month, 13 pct higher than the mid-month period, raised new car sales to about 394,500 units for May, according to Ward's Automotive Reports, an auto industry statistical agency. This is about 8.5 pct higher than April's auto sales of 363,700 units. The previous peak for the year had been January at 380,000 units.

Reports from individual automakers back up Ward's estimates. Chevrolet said sales of its cars and trucks totaled 54,170 units in the last 10 days of May, highest for any similar period this year.

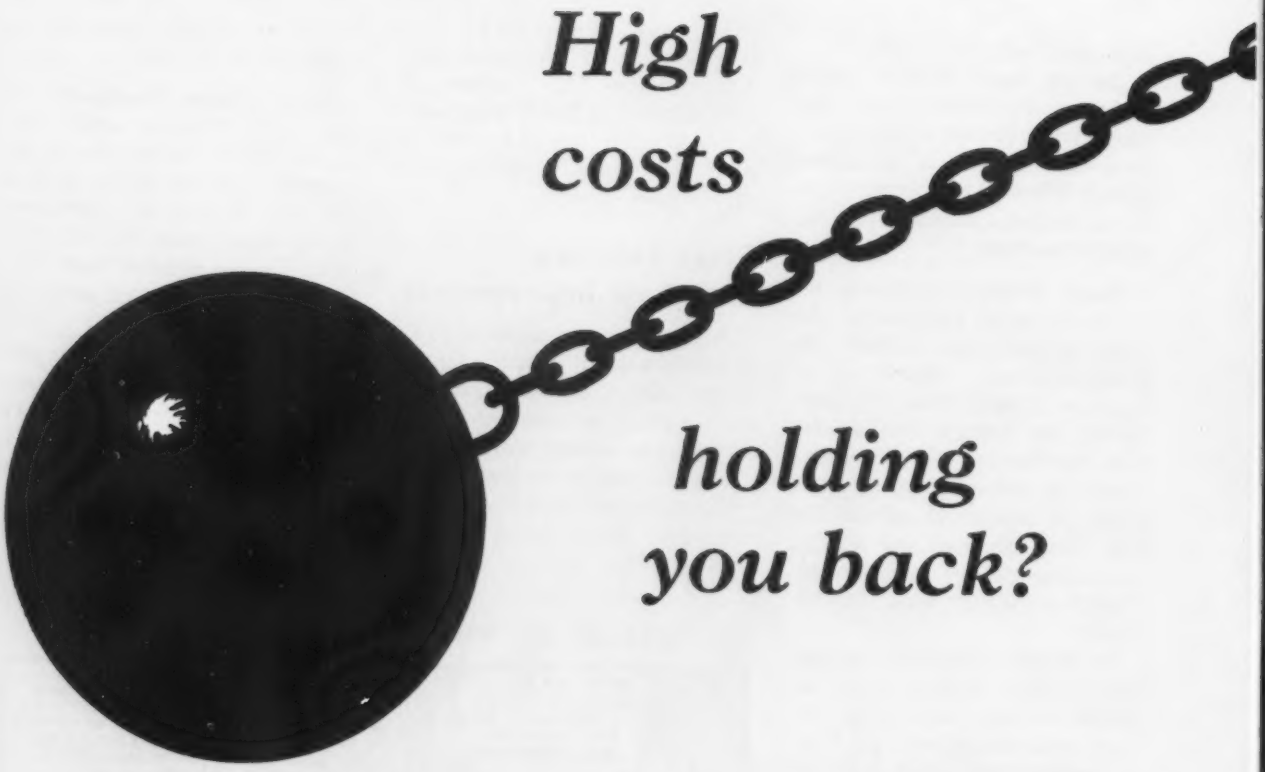
Chevy Widens Margin—At the same time, Chevrolet once again staked its claim for first place in the industry, a position it lost to Ford last year. It said its registrations through April totaled 419,962 cars, or 95,783 units ahead of Ford. This, Chevy said, was its widest margin in 25 yrs.

Rambler announced another record busting month—third in succession. May sales zoomed to 20,349 units—more than double a year ago. Sales last May totaled 9961. May's Rambler sales were also up 32 pct over the 15,418 units delivered in April, the previous record month.

THE BULL OF THE WOODS

HEY-- HAAY! WOT'S TH' DELAY? I GOT WOIK TO DO-- SERVICE HERE! SERVICE!
THERE'S ONE OF TH' MANY REASONS THERE CAN NEVER BE A PARADISE ON EARTH--THAT LAZY LOAFER SHOWIN' UP A FELLER WORKER!
WHY, HE'S IN PARADISE RIGHT NOW! WHAT'S TH' MATTER WITH YOU? WHAT WOULD BE A PARADISE FOR YOU OR ME WOULDN'T BE FOR HIM!
TOOL ROOM
BAM
BANG
BANG
BLISS

High costs holding you back?



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Is Deficit Getting Out of Hand?

It Puts Tax Cuts Farther and Farther Away

It's painful to think about, but the Government may run $13 billion into the red next year.

Spending is only half of it. Federal revenues are off sharply too.—By G. H. Baker.

▪ The Administration's budget is getting far out of balance. The deficit for this fiscal year (ending on June 30) is going to be around $3 billion.

But the deficit for the new fiscal year (starting July) is going to be a sobering $11 billion-plus. And some fiscal experts predict the deficit next year will be as much as $13 billion. Never before, in time of peace, will there have been such a large deficit.

It's Embarrassing — This is all very embarrassing to the Eisenhower Administration, which won two elections partly on the grounds that it would strive for balanced federal budgets.

But two adverse factors have combined to produce the imbalance:

(1) Federal spending is climbing higher than had been anticipated, due partly to the higher cost of defense and also to a whole host of anti-recession programs enacted by the Congress.

(2) Federal revenues are off sharply, due to the slow pace of business. (All forms of tax collections—corporate revenue, individual incomes, and excises—are running away behind what had been anticipated.)

No Tax Cuts—What this means is that any meaningful tax cuts are now postponed indefinitely. We may see a new tax law this year providing some relief for smaller firms, and possibly some relief on the 10 pct automobile excise tax, but any worthwhile reductions for incorporated business and for individuals have been pushed out of sight by the deteriorating condition of the budget.

Reciprocal Trade Bill Advances

Prospects of full congressional approval of the Eisenhower Administration reciprocal trade program are brighter this week.

The Administration trade bill showed unexpected strength in the House, which passed it on a 317-to-98 vote. As approved, the measure would permit a five-year extension of the reciprocal trade program. It would empower the President to reduce tariffs as much as 25 pct.

In the Senate, the bill will be the target of a number of out-spoken advocates of protective tariff policy. But few, if any, substantive changes by the senior body are anticipated. As was the case prior to the House vote, the Administration may offer concessions on fringe matters so as to break down opposition.

NLRB Wants Funds

More federal control over labor-management problems is coming, if the Administration can persuade the Congress to vote the necessary funds for policing and enforcement.

Jerome D. Fenton, counsel for the National Labor Relations Board, tells Congress the NLRB would enter many more labor disputes if it had another $2.7 million a year to hire the necessary investigators and lawyers.

Why Congress Stalls on Labor Laws

Congressional wrangling over labor reform is stifling chances for even the mildest kind of corrective law this year.

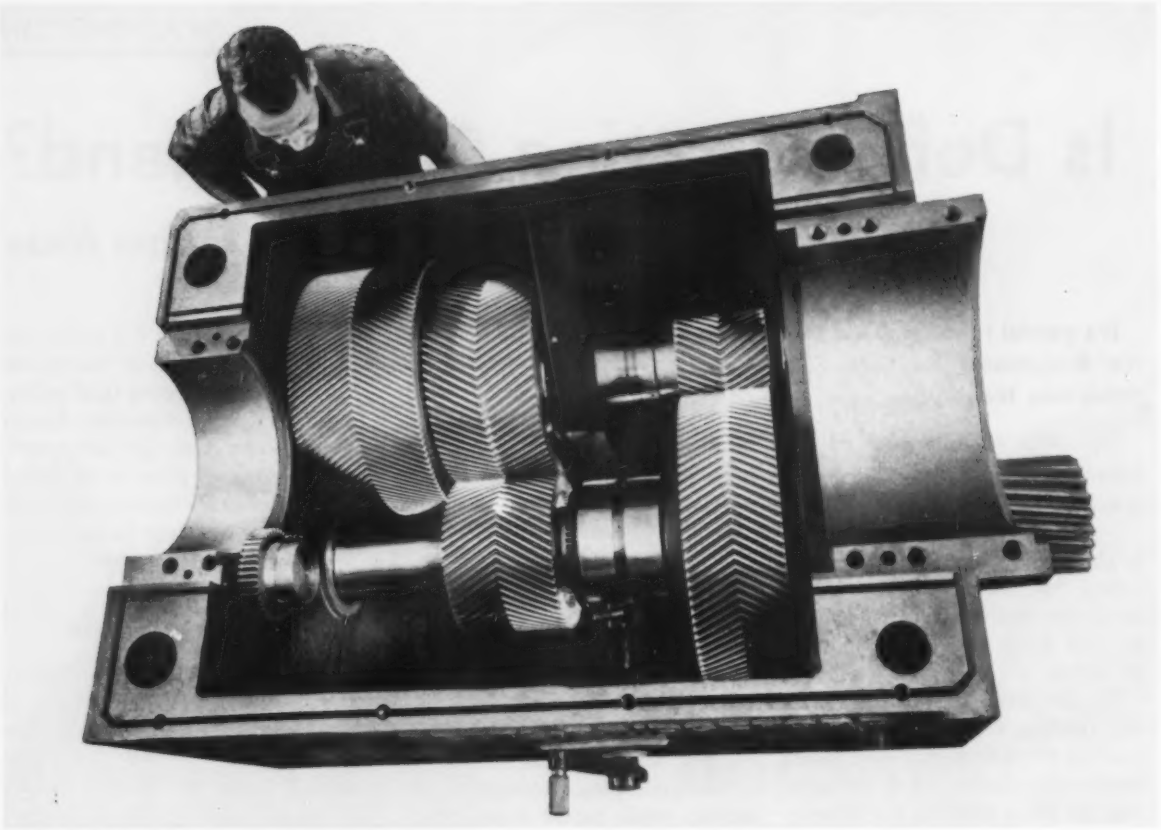
Earlier this year, it appeared that Congress would at least make a start to a clean-up by requiring registration of employee pension and welfare funds. But now it's doubtful if even this moderate proposal will be enacted this year.

Two Extremes — In the Senate, tempers are beginning to boil on the subject of labor reform. On one extreme, there's Sen. McNamara, D., Mich., who frankly states he'll do all he can to prevent any kind of labor-reform bill from being approved by the Senate this year.

On the other hand, we have Sen. Goldwater, R., Ariz., who is pressing his colleagues to vote a ban on organizational picketing, and to require membership referendums before any union can call a strike.

House Lags — It's extremely doubtful that these proposals will be approved. Unions are violently opposed.

In the House, a subcommittee looking into labor reform proposals has been droning along for weeks and now says it doesn't expect to finish its job until July at the earliest. Point is, this means that there's virtually no chance of getting any meaningful House action on labor reform this year.



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Aside from the obviously fine finish of the gears in the large lathe headstock above, there's another sure clue to their precision—the teeth are continuous across the face. That is a characteristic of herringbone gears made on a Farrel-Sykes generator, although the gears can be made with a center groove when required.

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Big Missile Support Market

Look Into Ground Support Equipment Potential

For every $1 spent on missiles, $1.50-$2.00 will be spent for ground facilities.

Needs include launchers, launch control, and maintenance gear.—By R. R. Kay.

▪ If you can't make any headway getting parts contracts for missiles, keep this in mind. There's even a larger market in ground handling, support, and launching site equipment.

For every dollar spent on the airborne package, about $1.50 to $2 goes to support it.

A complete weapons system includes not only the missile but its ground guidance equipment, too. A great deal of support material is needed: Launchers, launch control and checkout, ground handling, servicing, and maintenance gear.

Other Needs—And that's not all. The military needs bases from which to launch the missiles—including structures, and utilities. Then there must be supplies of propellants, spare parts, and a myriad of other paraphernalia.

In an interview with The IRON AGE, William M. Duke, vice president of Ramo-Wooldridge's Space Technology Laboratories, said, "If future IRBM and ICBM systems emphasize mobility, their handling equipment and launch pad facilities may take an even greater part of the missile dollar.

Man to See—"However, if future systems involve smaller missiles, handling equipment will become more standard," Mr. Duke said. Whichever way the wind blows, missile handling is big business.

All this fits neatly into the broad metalworking industry. So if you're interested, Major General Funk, Ballistic Missiles Manager of the Air Materiel Command, is your man. His headquarters are in Inglewood, Calif.

Snark on Mark

Northrop Aircraft's Snark, an Intercontinental guided missile, is "ready now" for large-scale production. That's the word from Vice-Pres. John R. Alison. He says it's the nation's only operational weapon with a 5000 mile capability that is ready to fire today.

Northrop is waiting for the go-ahead from the U. S. Air Force. If it gets the order, some 20,000 jobs await southern Californians.

In the meantime, the company is laying off 100 workers per week at its Hawthorne, Calif., plant. And that rate will continue for the next two or three months.

Minerals Growth

The Pacific Northwest's industrial minerals output has topped $50 million per year. Many industrial mineral products are still shipped in. But when greater demand makes it feasible they, too, will be processed from local deposits, according to Chester K. Sterret, Secretary, Raw Materials Survey.

Boeing Studies Icing Problems

OPERATION "ICE MAKER"; This contraption was rigged up by Boeing equipment for anti- and de-icing flight tests. Horizontal bars spray water onto the engine to create icing conditions.

Can Industry Afford New Tools?

Cost of Not Replacing May Be Higher, Economist Says

An executive who turns his back on new equipment may be doing his firm a disservice.

Modernization can sometimes make more money than new products.—By E. J. Egan, Jr.

▪ Why don't more metalworking plants replace antiquated machine tools with up-to-date models, as they're constantly being urged to do?

Marvin J. Barloon, professor of economics at Cleveland's Western Reserve University, thinks there are two reasons. He detailed their significance at the recent Westinghouse Machine Tool Electrification Forum.

"One," he said, "is the deep-seated habit of regarding a machine as a way to make goods—not as a way to make money. Probably another reason is that for such a long time this has been a capital-poor country. We hung back from putting money into modernization because we were so hard pressed for money to put into expansion."

For Instance—Expanding on his first reason, Barloon accused many industrialists of "a strong bias in favor of keeping in service . . . any machine which will do the job.

"When you place before [such] an executive a proposal to replace an outmoded machine with a new model, what does he look at hardest? He looks at the high cost . . . he tries to be what he calls 'conservative.' In figuring a pay-off period he makes it short. He challenges the builder's salesman to prove that he ought to make the replacement.

One-Sided Approach—"He does not ordinarily come up with replacement proposals of his own and make somebody else prove that they should not be made," Barloon continued. "He takes this for granted. In considering the cost of replacement, he ignores the cost of not replacing."

Barloon hammered home the idea that a "new machine is not installed for its convenience, safety, accuracy, or speed." He views a replacement tool as an investment and declared "it should be rejected or accepted strictly on the income it promises to yield."

Budget Analysis Helps—Judging this, potential investment income calls for a sound tool-replacement policy, Barloon said. Then he added another essential: Capital budgets should list the investment opportunities offered by machine replacement. They should be considered just as carefully as the income yield promised by investments in research and development programs, new plant construction, or expanded sales efforts.

Barloon pointed at the corporate executive who "thinks he's done a good job" when an investment in product research and development yields a net return of 15 pct. "He might have put the same money into a modernization program and gotten 20 to 30 pct out of it, and he would have done a much better job.

Ten Operations in One Setup

FAST WORK: In one chucking on a Warner & Swasey turret lathe, Ohio Gear Co. does 10 separate operations on this cast iron gear blank.

When is the best time for re-evaluation? Right now!

WHILE the consumer is resting, American industry has the opportunity of taking a long, hard look at its production facilities. Many plants today are a hodge-podge of small departments that grew like Topsy during the post war period when there was no time for intelligent planning.

Soon the lights will flash green again. The manufacturer who has rearranged his plant to comply with latest trends in automation, straight-line flow principles and modern plant layout, will be ready for the flood of orders that will result from hoarded consumer dollars rushing back into circulation.

Manufacturers who fail to take inventory now, may find themselves in an unfavorable competitive position tomorrow.

Why put off the inevitable? An evaluation consisting of estimated capital outlays for plant and equipment; operating costs and projected savings; and a complete proposal for presentation can be yours by completing and mailing coupon today.

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Combination Sandwich — The Budd Co., Philadelphia is working with the Navy Bureau of Aeronautics in the development of the most efficient and economical means of producing a light-weight high strength sandwich type metal structure which has wide potential application in missiles, and high speed manned aircraft.

Missile Manager — Dr. C. L. Register has become manager, Ballistic Missile Div., Burroughs Research Center, Paoli, Pa. Dr. Register will head up the Atlas missile guidance program. Burroughs Corp. holds prime contracts in excess of $60 million in the U. S. Air Force missile program.

Know Your Computers — Computers for application to all industries will be discussed by experts at the 1958 Computer Clinic—Sept. 16. It will be held during the 13th Annual Instrument-Automation Conference—Sept. 14-19, at Convention Hall, Philadelphia.

Half-Way Mark—Construction is nearing the half-way mark at Union Carbide Chemical Co.'s Technical Center in S. Charleston, W. Va. When completed, a campus - like complex of buildings and laboratories will house Carbide's research, development, engineering, and design and construction departments.

"He's the new trouble shooter up from the Texas branch."

It's Shocking—The U. S. Army Surgeon General has awarded a contract to Bostrom Research Laboratories, Milwaukee, for a second year of research on the effects of vibration and road shock on military drivers. The project is part of Bostrom's continuing program to measure the human factors affecting engineering design.

Castings Award — J. H. Smith, general manager, Central Foundry Div., General Motors, was presented the 1958 McCrea Medal by the Malleable Founders' Society. Award is in recognition of his outstanding service to the malleable iron castings industry.

Sea Duty—Feedwater pump differential controls for nine U. S. Navy destroyers will be supplied by Hagan Chemical & Controls, Inc., Pittsburgh. These controls, which regulate speed of the turbine-driven feedwater pumps, were ordered by Worthington Corp., N. J., builder of the feedwater pumps.

Into Georgia—A new sales office to serve the southeastern states has been opened at 1371 Peachtree St., N. E., Atlanta, Ga., by Commercial Shearing & Stamping Co. Commercial is a custom producer of stampings and upset forgings, and fabricates tunnel liner plates and support steel for tunnels and other excavations.

Bigger and Better—Spectrochemical Laboratories, Inc., Pittsburgh, has completed a $300,000 expansion program and has moved its operations to a new location at 8350 Frankstown Ave., Pittsburgh. The company offers complete spectrographic and analytical services to industry, government, research institutions and colleges.

Missile Expansion—Bendix Aviation Corp.'s Eclipse-Pioneer Div. has purchased a building adjacent to the division's present 100-acre installation. It will be part of a planned expansion in the field of electronic systems for aircraft and missiles. Purchase was made from Electronic Communications, Inc., St. Petersburg, Fla.

Community Interest—More than 11,000 persons visited the Fairfield steel works of Tennessee Coal & Iron Div. of U. S. Steel Corp. at Birmingham, Ala., in 147 conducted tours from Oct. 1, 1957, through May 31, 1958, when the tours were discontinued for the summer. Regular tours, totaling 87, were for the public. Remaining 60 tours were for special groups. The tours will be resumed in October.

New Plant, New Order—The Dale Smith Automatic Screw Machine Products Co., Silverhull, Ala., will move to a new plant at Whistler, a Mobile, Ala., suburb. The plant is expected to be in operation in 60 days. The company will begin work on a $250,000 government contract for machine parts when it moves.

Woman of the Year—The Society of Women Engineers has named Mabel Rockwell of Westinghouse as "woman engineer of the year." Mrs. Rockwell is doing pioneering electrical design work on the Polaris fleet ballistic missile launching and handling system being developed at the Westinghouse Sunnyvale, Calif., division, under a prime Navy contract.

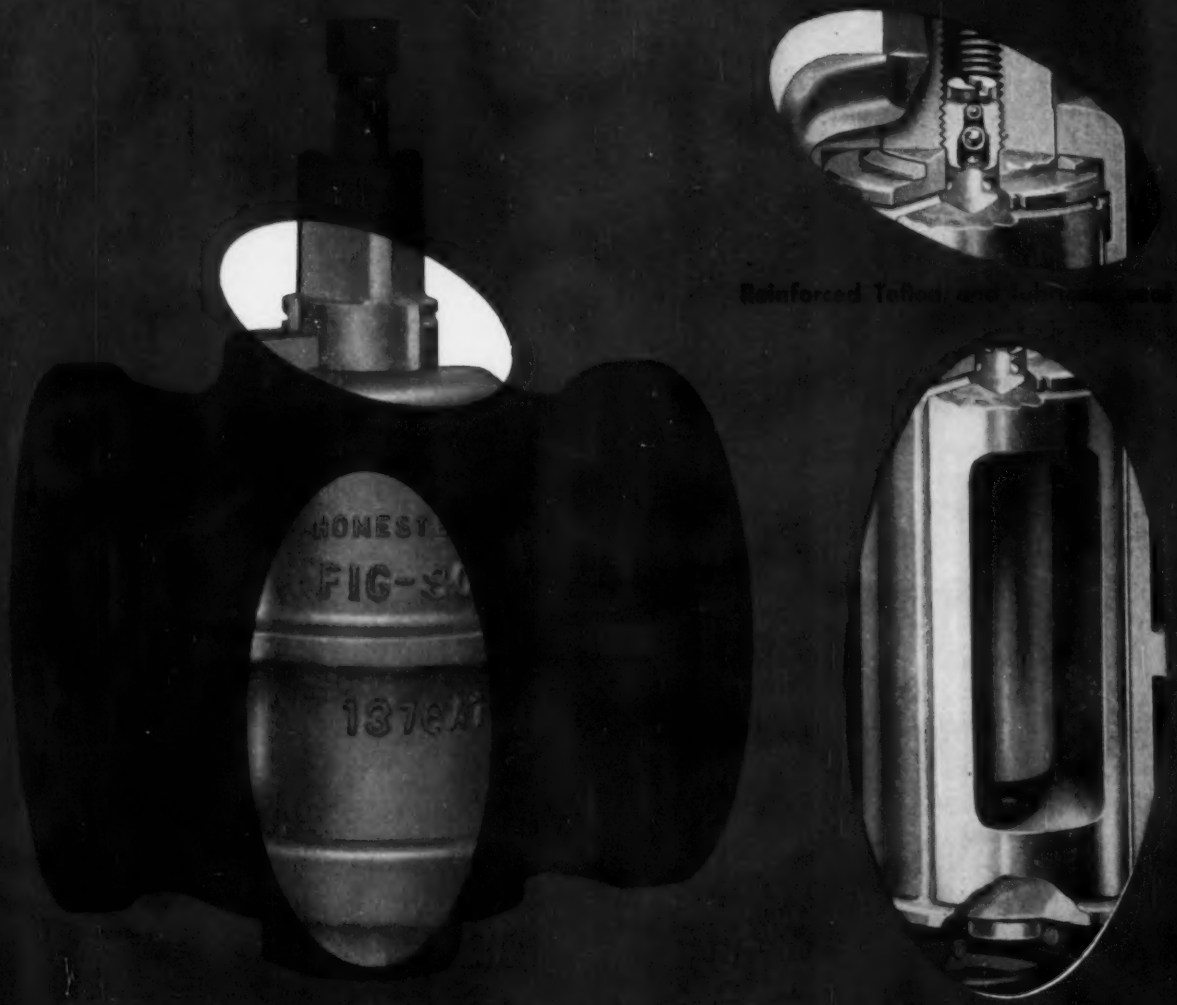
Aluminum IQ—Aluminum Co. of America is sponsoring a contest open to architects attending the 101st American Institute of Architects Convention at Cleveland, July 7-11. The competition will test the familiarity of the architects with aluminum buildings across the country.

Moving Southwest — Ampco Metal, Inc., Milwaukee, has dedicated its new $250,000 foundry and southwest sales center in Gardland, Tex. Ampco manufactures special aluminum bronze alloys and alloy products.

For a Clear Picture — General Electric Corp. this fall will begin manufacturing television picture tubes in Augusta, Ga., for replacement purposes in the South. The company will take over and enlarge the Thomas and Howard Bldg., 548 Calhoun St., Augusta.

In the spots that count ... Homestead Valves are

LEAKPROOF



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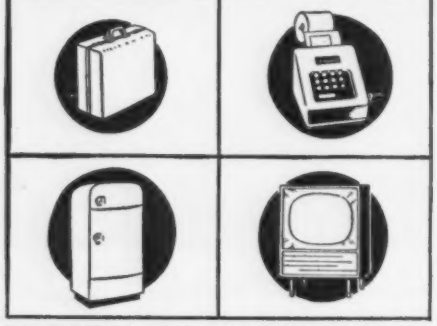

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Crucible Steel Company has set up a new Technology department "to better coordinate scientific progress with changing customer requirements and improved steelmaking practice." The new department will be headed by **Dr. M. J. Day,** formerly vice president, research and development, who was named vice president, technology; **D. I. Dilworth, Jr.,** appointed director, metallurgy; **W. E. Gregg,** was named director, technical development, and **Dr. W. L. Finlay,** director of research.

W. C. Root, appointed president, Graver Tank & Mfg. Co., E. Chicago, Ind.

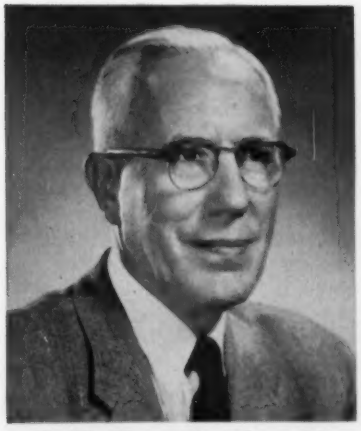
J. W. Gosselin, appointed president, and chief executive officer, Phoenix Mfg. Co., Joliet, Ill.

R. J. Sahr, appointed president, Thermal Transfer Corp., Pittsburgh.

C. J. Ramsburgs, Jr., will become executive vice president, Pittsburgh Gage & Supply Co.

A. B. McCloskey, named vice president, marketing, Westinghouse Electric International Co.; **R. L. Jeans,** appointed vice president, products; **R. D. McManigal,** named vice president, and asst. to the president.

A. L. Prentice, elected vice president, Rochester Iron & Metal Co., Rochester, N. Y.



H. M. Heyn, elected president, Surface Combustion Corp., Toledo, O., and president, Surface Industrial Div.

N. M. Forsythe, elected president, National Automatic Tool Co., Inc., Richmond, Ind.

J. P. Kadlic, appointed New York district sales manager, and **E. A. Frazier,** appointed Seattle district sales manager, Wire Rope and Aircord Div., John A. Roebling's Sons Corp., Trenton, N. J.

J. O. Peale, appointed manager, distributor sales, The Carpenter Steel Co., Reading, Pa.

F. L. Johnstone, named comptroller, U. S. Steel Supply Div., U. S. Steel Corp., Chicago.

E. C. Helmke, appointed chief engineer, Gisholt Machine Co., Madison, Wis.

R. A. Bell, elected executive vice president, Surface Combustion Corp., Toledo, O., and president, Janitrol Div.

F. J. Durzo, named vice president, manufacturing, The Jeffrey Mfg. Co., Columbus, O.

D. S. Foote, appointed works manager, Titanium Div., Crucible Steel Co. of America; **H. T. Clark, Jr.,** named manager, Midland (Pa.) Research Laboratory.

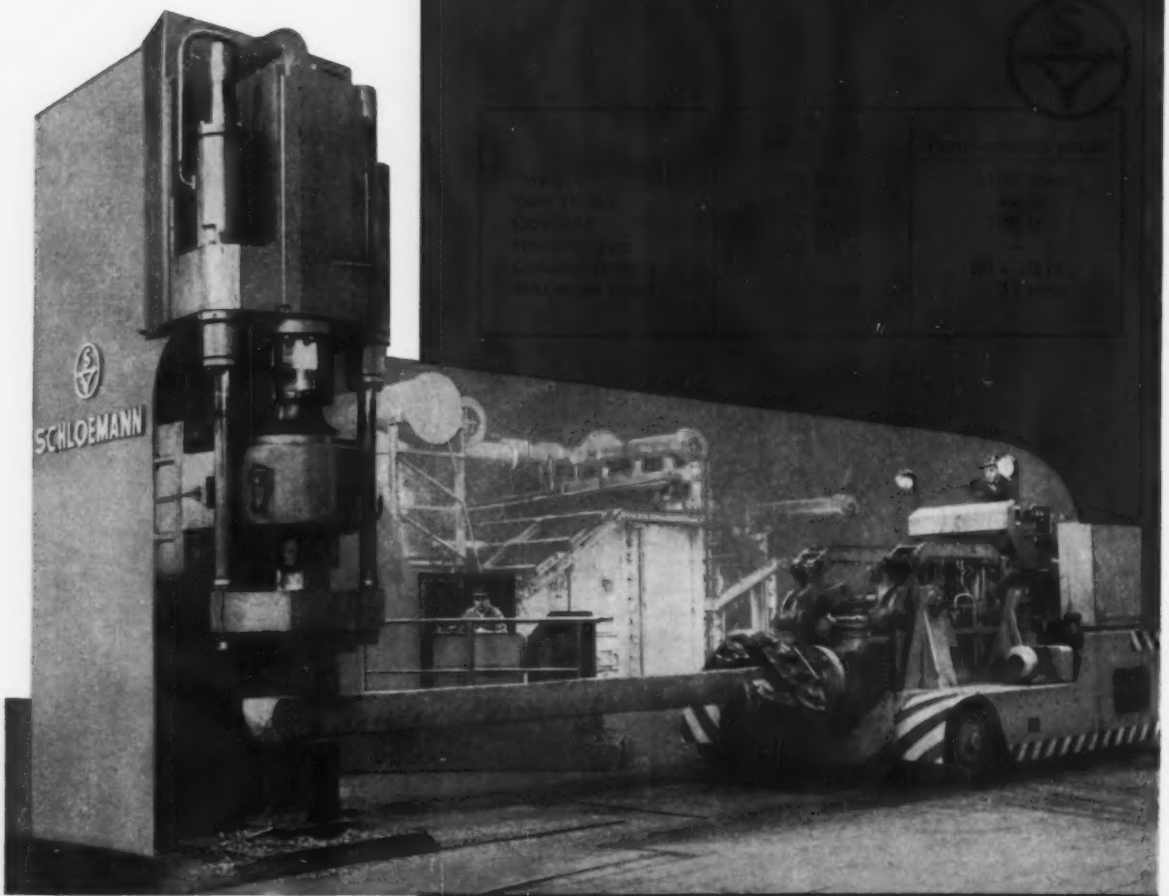
W. C. Campbell, appointed superintendent, merchant mills, Youngstown district, The Youngstown Sheet & Tube Co.

B. A. Lucas, Jr., appointed manager, sales, Ingersoll Products Div., Borg-Warner Corp., Chicago.

J. M. Crawford, named asst. general sales manager, Disston Div., H. K. Porter Co., Inc.

W. E. Gregg, named director, technical development, Technology Dept., Crucible Steel Co. of America.

SCHLOEMANN



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Dr. Leonard Reed, M. L. Van Dreser and **J. R. Bachman,** appointed specialists, basic refractories research and development activities, Milpitas, Calif., laboratory, Kaiser Chemicals Div., Kaiser Aluminum & Chemical Corp.

Dr. W. L. Finlay, named director of research, Technology Dept., Crucible Steel Co. of America.

R. E. Breitung, appointed sales manager, foundry products, Kaukauna Machine & Foundry Div., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

G. R. Thomas, appointed asst. manager, building sales, Stran-Steel Corp., Detroit.

H. H. Gillespie, appointed general manager, Split Ballbearing Div., Miniature Precision Bearings, Inc., Lebanon, N. H.

R. H. Evans, appointed corporate vice president and general manager, Packaging Div., Olin Mathieson Chemical Corp.

D. A. Porco, named manager, Corporate Development Section, Crucible Steel Co. of America.

M. S. Feltz, appointed marketing manager, Acro Div., Robertshaw-Fulton Controls Co., Columbus, O.

J. K. Sutter, appointed manager, tubular sales, The National Supply Co., Pittsburgh.

Carroll Copps, appointed corporate vice president and general manager, Energy Div., Olin Mathieson Chemical Corp.

N. B. Mortimer, appointed sales engineer, Crane and Bridge Sales Dept., Dravo Corp.'s Engineering Works Div.

Edward Block, appointed senior vice president, Chemicals Div., Olin Mathieson Chemical Corp.

G. C. Wilhide, Jr., appointed general manager, Black & Decker Mfg. Co., Ltd. of Brockville, On-

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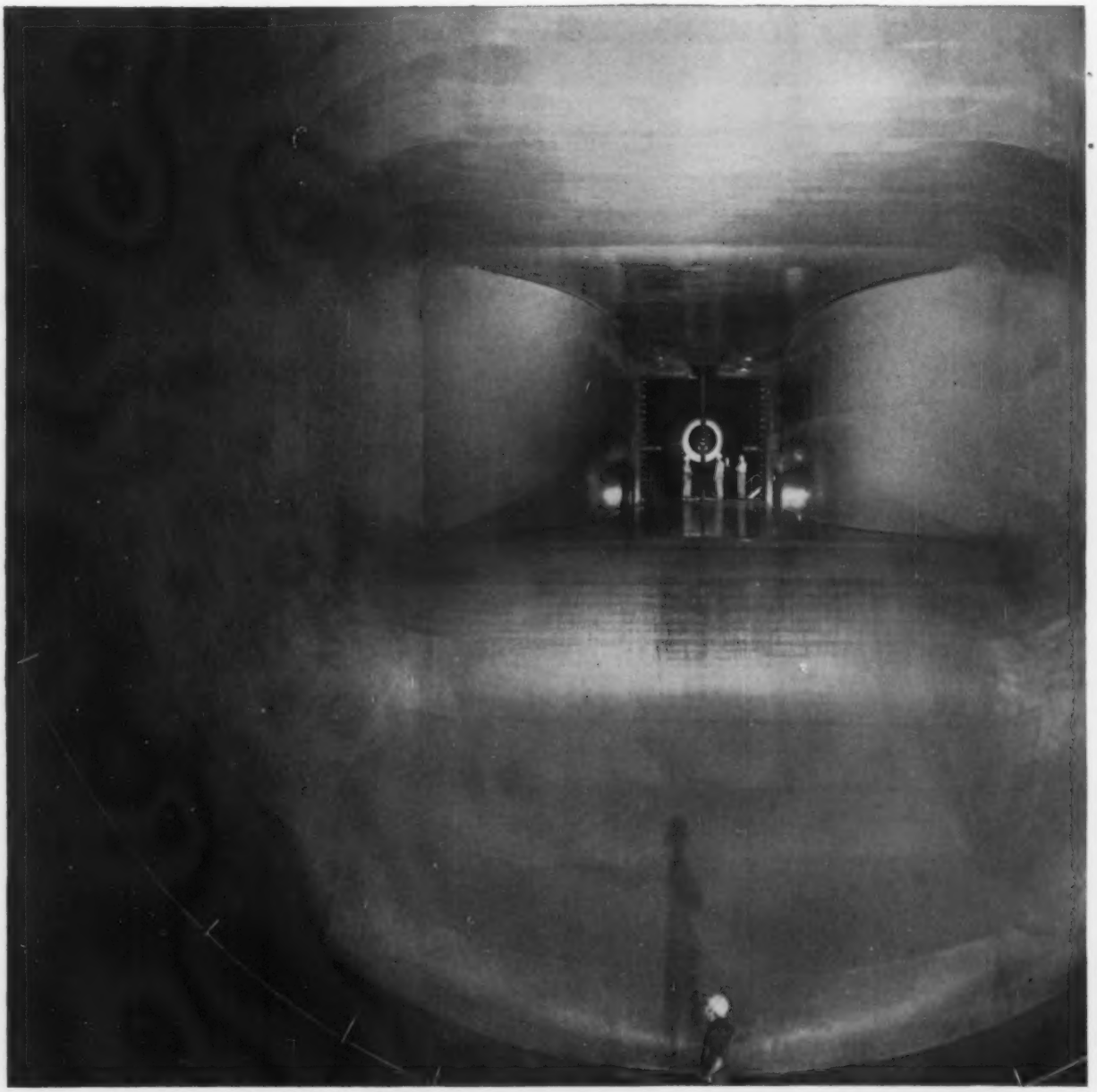

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You could run a two-lane highway through this steel wind tunnel at the U. S. Air Force's Arnold Engineering Development Center, Tullahoma, Tennessee. One of the biggest in the world, it's used to test full-size jet engines and large models of aircraft and missiles under simulated flight conditions. U. S. Steel played a major role in building and equipping this vital research center . . . with special steels developed by USS. *USS is a registered trademark*

American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel • National Tube • Oil Well Supply Tennessee Coal & Iron • United States Steel Homes • United States Steel Products • United States Steel Supply and Gerrard Steel Strapping United States Steel Export Company • Universal Atlas Cement Company

you get STEEL + PLUS

STEEL + PLUS IN ACTION:
RESEARCH

What in the world will touch the moon first? It looks now like it might well be a type of steel similar to that recently developed in U. S. Steel's research laboratories. It's called USS-12 MoV Stainless Steel. Exceptionally strong (225,000 psi), it's ideally suited for the skin of missiles and rockets because it retains high strength even under the fierce heat of unearthly speeds.

STEEL + PLUS IN ACTION:
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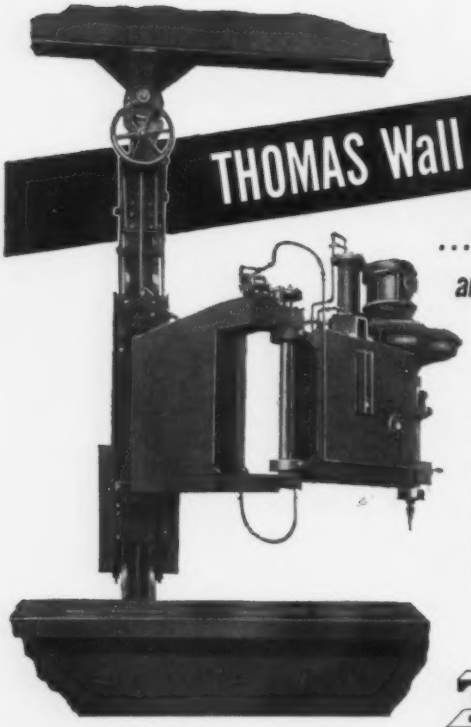
Sometimes a steel is *too* good for the job. A USS customer was glad to find that out recently when he ordered a premium-priced steel to make into shock absorber caps. A USS metallurgist studied the customer's specifications for the steel and realized that our regular hot-rolled commercial-quality steel would do the job just as well. He recommended the less expensive steel. The customer tried it and found it completely satisfactory, effecting a worthwhile saving.

STEEL + PLUS IN ACTION:
MARKETING ASSISTANCE

Go back ten years and try to think of the building that did not have walls of wood, brick, glass, or stone. Now look at your city—and count the new buildings with colorful curtain walls of steel. Like all new ideas, curtain wall construction calls for a wealth of new concepts, technical data (and not a little "hard selling"), so USS engineers and market specialists make frequent calls on the men who influence the construction of new buildings. Result: more business for our customers who make steel curtain wall building components.

USS **United States Steel**



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... for drilling plates, angles and beam flanges too heavy to punch

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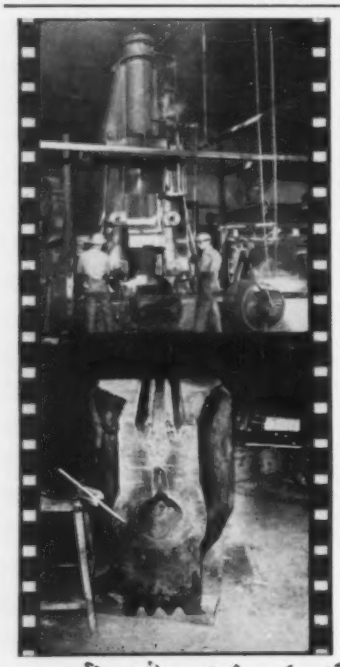

ARCAIR TORCH Solves Hammer Repair Problem

Schmitt Steel Co. of Portland, Ore., has profited twice from the Arcair advice of a local welding supply distributor, Industrial Specialties Co.

Both jobs, several months apart, involve breakdown repair of ram type forging hammers with vertical splits in the hammer heads. The head of the 10,000 lb. capacity hammer (photos) was split full length, 37½", to a depth of 8".

Bought on the basis of speed, efficiency and economy, the Arcair process took just 2½ hours' gouging time. Total material?—fifty-six ⅜" Copperhead electrodes, at cost of just $8.62. And absolutely no clean-up was required!

You, too, can profit from Arcair, in maintenance as well as production. Basic simplicity—electric arc plus ordinary compressed air—makes Arcair the new, efficient, cost-cutting answer to your metal removing problems.

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Arcair Metal Removal Torches

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tario, subsidiary of The Black & Decker Mfg. Co., Towson, Md.; **A. N. Dahl,** appointed purchasing agent, The Black & Decker Mfg. Co., Towson, Md.

J. E. Williams, named corporate vice president and general manager, Metals Div., Olin Mathieson Chemical Corp.

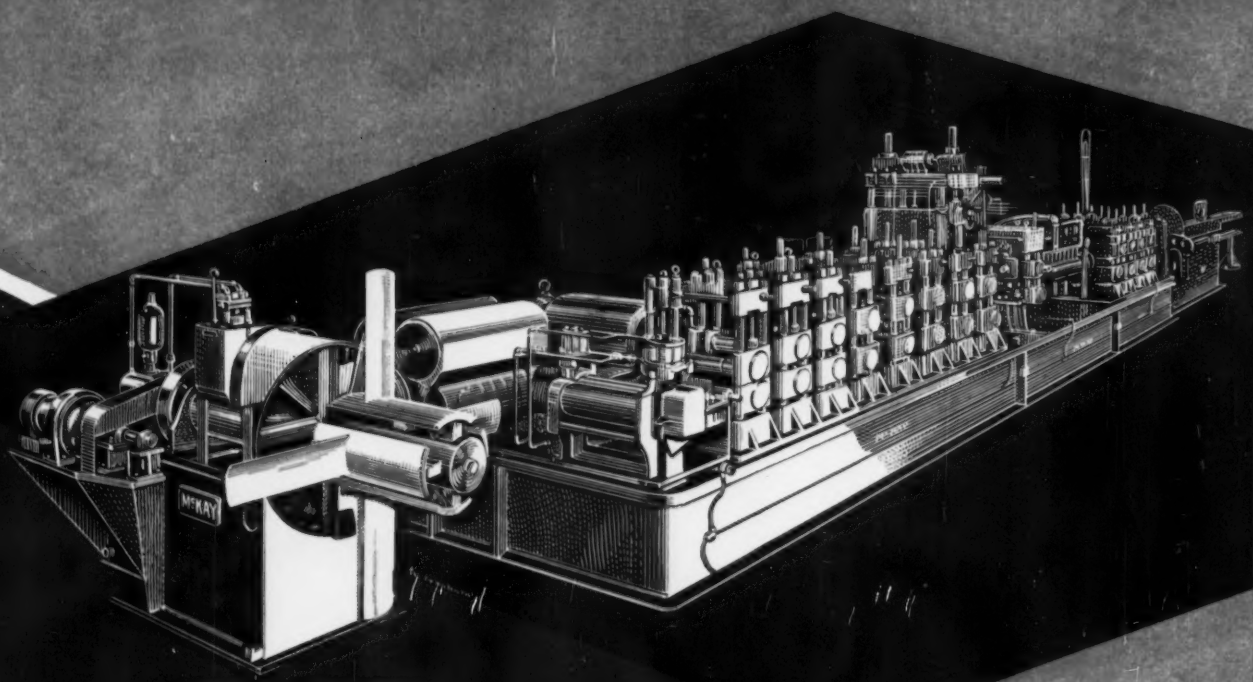
J. W. Swantz, appointed district manager, Wheelabrator Corp.'s Pittsburgh sales office; **R. F. Morgan,** named sales engineer; **R. F. Duff,** named abrasive engineer.

H. L. Wright, appointed manager, special product sales, Hanson-Van Winkle-Munning Co., Matawan, N. J.

R. B. Meneilly, appointed manager, tin plate products, U. S. Steel Corp.

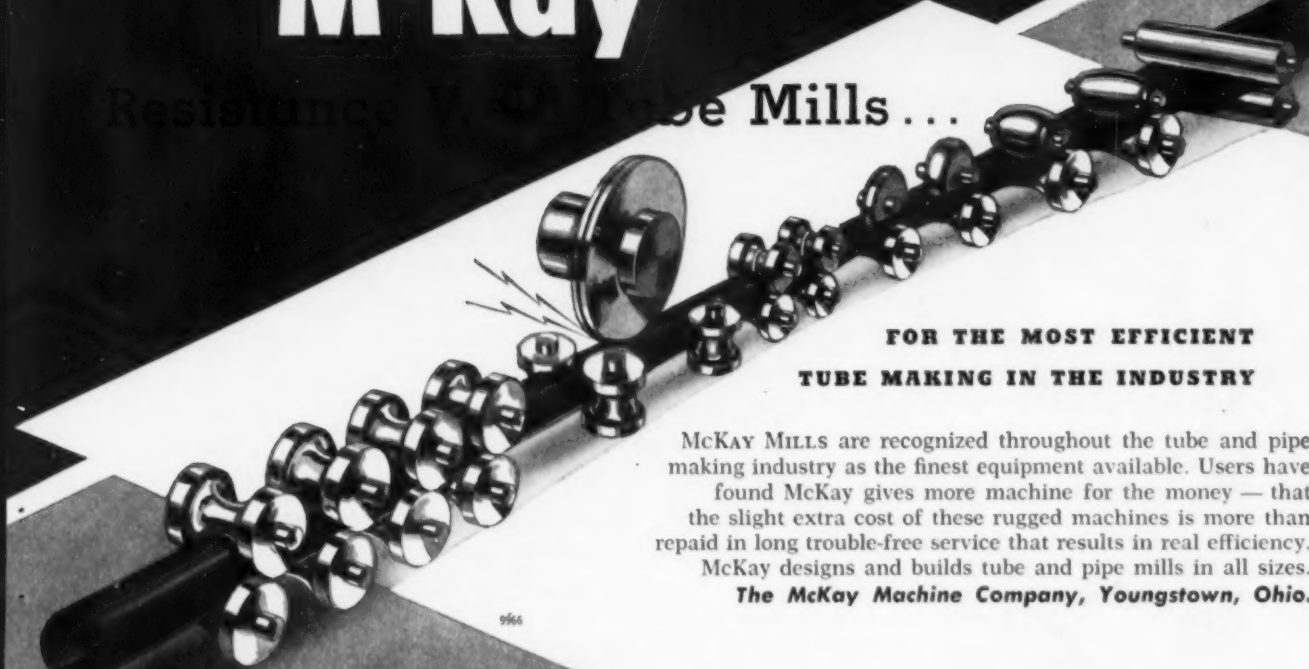
H. A. Patrick, promoted to works manager, Magnetic Metals Co., Camden, N. J.

S. J. Northrop, appointed chief industrial engineer, Industrial Engi-



McKay

Resistance Welded Tube Mills . . .



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McKay Mills are recognized throughout the tube and pipe making industry as the finest equipment available. Users have found McKay gives more machine for the money — that the slight extra cost of these rugged machines is more than repaid in long trouble-free service that results in real efficiency. McKay designs and builds tube and pipe mills in all sizes.

The McKay Machine Company, Youngstown, Ohio.

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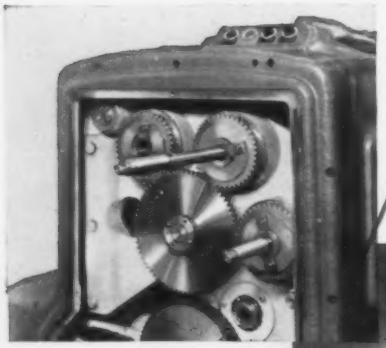
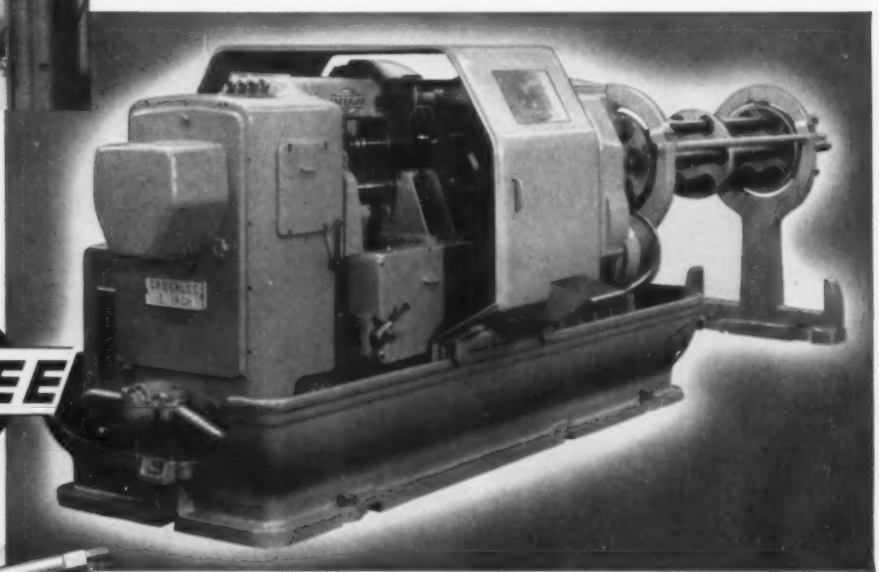
McK

SETTING THE STANDARDS OF QUALITY IN METAL WORKING MACHINES FOR TWO GENERATIONS



GREENLEE LEAD-SCREW FEED ASSURES *Precision* THREADING and TAPPING

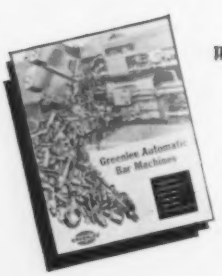


PRODUCTION MACHINERY

GREENLEE

PRODUCES UNIFORM HIGH QUALITY... Reduces Scrap... Lowers Costs!

The Greenlee precision lead-screw threading arrangement makes it easy to machine parts otherwise impractical on an automatic bar machine. Precision Acme, tapered and multi-lead threads are machined in the high speed and feed ranges required. Smooth, clean thread form, fine fit and high tolerance concentricity make lead-screw threading profitable. Built-In Duplex clutches on 6-spindle machines reduce set-up time on simultaneous tapping and multi-tooled jobs. The profitable lead-screw arrangement can be applied to Greenlee machines in the field as well as on new Greenlee Automatics. It will pay you to investigate.



Want more information? Write today for Catalog A-405.

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neering Dept., SKF Industries, Inc., Philadelphia; **J. L. Listman,** named staff assistant.

G. A. Markell, appointed sales manager, The Elwell-Parker Electric Co., Cleveland.

Oscar Ahlers, appointed general manager, The Sheffield Corp., Dayton, O.

D. R. Angle, named factory sales representative, Ingersoll Kalamazoo Div., Borg-Warner Corp., Kalamazoo, Mich.

E. G. Howard, appointed Washington, D. C., representative, Pesco Products Div., Borg-Warner Corp.

Nelson McRoberts, appointed Detroit district representative, Hevi-Duty Electric Co., Milwaukee.

G. F. Murphy, named asst. chief construction engineer, Aluminum Co. of America, Pittsburgh.

S. L. Nitkiewicz, promoted to chief enigneer, Abbey-Etna Machine Co., Perrysburg, O.

D. S. Grewar, named sales engineer, Chicago area, Exomet, Inc., Conneaut, O.

OBITUARIES

F. C. Dull, 63, vice president-treasurer, The Monarch Machine Tool Co., Sidney, O.

Dr. V. N. Krivobok, 65, supervisor, Stainless Steel and Heat-Resistant Alloy Section, Development and Research Div., The International Nickel Co., Inc.

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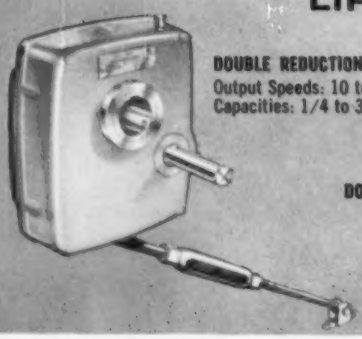

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Output Speeds: 10 to 160 RPM
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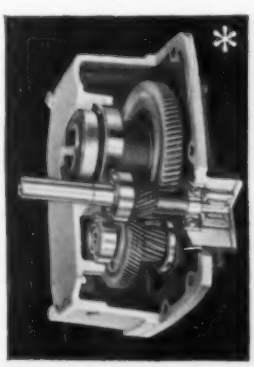
Output Speeds: 10 to 135 RPM
Capacities: 1 to 7 HP

Foote Bros. Shaft Mounted Drives offer more efficient, more economical, power transmission. They incorporate exclusive Duti-Rated Lifetime Gearing — the high hardness, balanced design, premium quality gearing that combines greater load carrying capacity with long service life.

Used with standard V-Belts and Sheaves, Foote Bros. Shaft Mounted Drives will provide virtually any output speed you may require. Quick, easy installation on driven shafts with diameters from 15/16" to 3-7/16" saves time, labor . . . eliminates need for reducer mounting, couplings, and adjustable motor mount. Built-in Backstop to prevent reverse rotation, Automatic Overload Release Torque Arm, Variable Pulley, are available as optional equipment.



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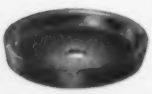

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C/R
CHICAGO RAWHIDE

Research to Aid Operators of Multiple-Spindle Bar Units

Big news for all operators of multi-spindle bar automatics is a new idea in applied research.

A 17-firm cooperative group is attacking machining problems common to this equipment.

Already under way, the well-conceived project should produce many worthwhile benefits.

■ Users of multiple-spindle bar automatics stand to get a wealth of information over the next few years on how to run these complex machines more efficiently. What's more, the course of lessons won't cost them a dime.

This free information will be in the form of down-to-earth reports showing just how typical, large-volume work components may be machined at the lowest cost per piece. Published in metalworking magazines and distributed in reprint form, these case-history studies will be available to all who want them.

Interestingly enough, the reports won't come from the usual type of industrial research institute. Nor will they come from the captive laboratory of any one firm with a special axe to grind.

Co-op Task Force — Instead, they'll be produced by a unique type of research task force, a non-profit study group sponsored by 17 firms allied with the production machining industry. Each makes one or more types of products considered essential to good multiple-spindle bar machine practice.

Just launched on its schedule of continuing studies, the task force has taken the name Cooperative Machining Project. For short, it's called COMAPRO.

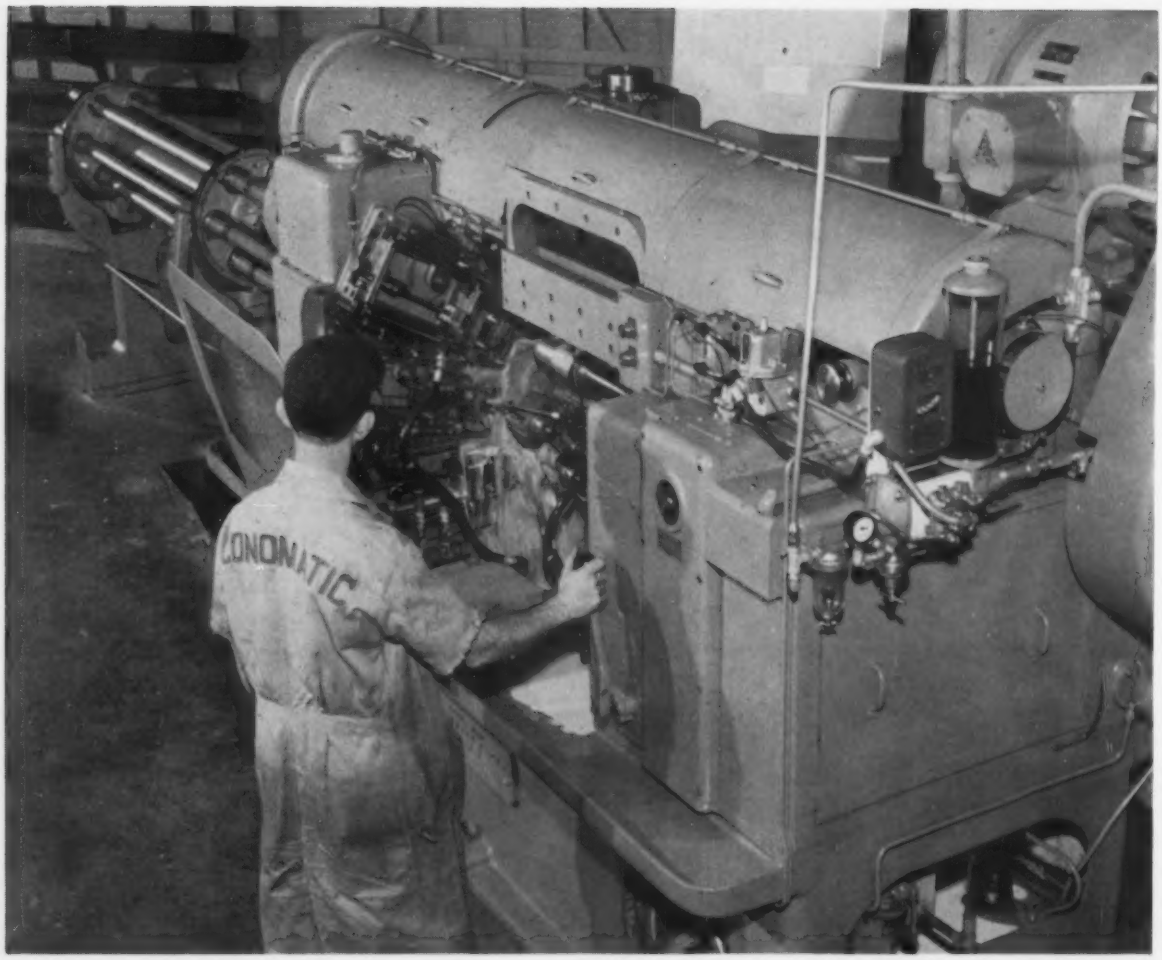
COMAPRO's nerve center is a walled-off area in the plant of the Cone Automatic Machine Co., Windsor, Vt. Cone officials originated the task force plan, and the company is one of its sponsors. But the COMAPRO work area is maintained by its own staff and is independent of the Cone plant's equipment and operations.

Well-Found Lab — COMAPRO technicians have assembled everything they need to study the six basic factors that affect the performance of any multiple-spindle bar automatic: (1) bar stock, (2) tools and tool holders, (3) measurement controls, (4) coolants and lubricants, (5) the machine tool itself, and (6) the personnel who supply and use items relating to the other five factors.

COMAPRO was born to cope with the fact that certain factors in machining practice and machining-cost analysis have been overlooked during the past 18 years. It's easy to see why this happened, especially with multiple-spindle bar automatics. The chief reason: two wars and a steady inflationary trend have created a heavy demand for high-production equipment.

As a result, the distribution of multiple-spindle bar machines has

INITIAL PROJECT: Spark-plug shells, stamped "COMAPRO—1958," are the first in a series of typical workpieces to be studied.



FOCAL POINT: Key item in the COMAPRO campaign to reduce machining costs is this Model TF Conomatic.

been both rapid and widespread. (COMAPRO estimates there are 150,000 more work spindles on such machines today than there are on single-spindle types and turret lathes combined.)

Not Enough Operators—But this flood of machines wasn't matched by an equal number of skilled men to run them. Competent operators are scarce and the rate of turnover is high. Inevitably, many of these machines have come to be used at something less than rated capacities. And unaware of all that their complex machines can do, many owners and operators err greatly in their cost analysis.

COMAPRO spokesmen refer skeptics to a survey made some time ago by the Screw Products Manufacturers Assn. It showed that multiple-spindle bar automatic shops varied widely in their price bids on the same workpieces.

Faced with this evidence of inefficient use of machines and guess-work cost estimates, Cone Automatic's management sought a practical answer to the twin problem. These men finally nailed down the six basic factors already listed. But they realized they couldn't go it alone in setting up optimum-practice recommendations for each one. Their specialty was the machine tool itself—just one of the essential factors.

Cooperation Needed—This led to the idea of a cooperative program in which Cone would join forces with reputable suppliers of bar stock, tools, measuring devices, coolants, lubricants, and the like.

Firms who were approached responded so well that there was a problem of choice in several cases. Participants were finally chosen on three counts: (1) promptness of their response to the suggested program, (2) the degree of their enthusiasm, and (3) their willingness to agree that their brand of product should be less important to the project goal than the type of product it represented.

Decide on Projects—COMAPRO intends to find the best ways to set up and machine typical, large-volume workpieces. They'll be similar to items machined every day from popular grades of steel bar stock with commonly used tool combina-

tions. Examples: a spark-plug shell (already being studied), a bushing, a bearing race.

COMAPRO procedure for each workpiece will be: First, analyze it carefully and prescribe optimum conditions for each of the six basic factors to yield the lowest cost per piece. Second, put the workpiece through a test run to prove or disprove the prescribed conditions. Third, give it a production run of about 20,000 pieces to get the actual cost with all conditions at the optimum level.

When COMAPRO is sure that it knows how to run each job at top efficiency, it will enlist the aid of The IRON AGE and other metalworking magazines in publicizing the details. Very likely, sponsors of the program will distribute reprints of these articles and reports to all who request them. Visitors will also be welcome to the COMAPRO area throughout the year.

Important Benefits — This information, project officials feel, should prove that users of multiple-spindle bar machines can cut costs way down by applying quality products and practices to each job. Moreover, users should find it helpful to compare COMAPRO practices with their own on similar types of workpieces.

Shop operators across the country won't have to worry about competition from COMAPRO. All of its trial workpieces will either be altered to non-standard dimensions or plainly stamped with the project's insignia. And except for those pieces which the sponsors will keep as samples, the remainder (plus all chips) will go back to a steel mill for remelting.

Work Under Way—A work study on the first typical production part, a spark-plug shell, started about four months ago. Here's what the sponsors have sent to Windsor for this particular study:

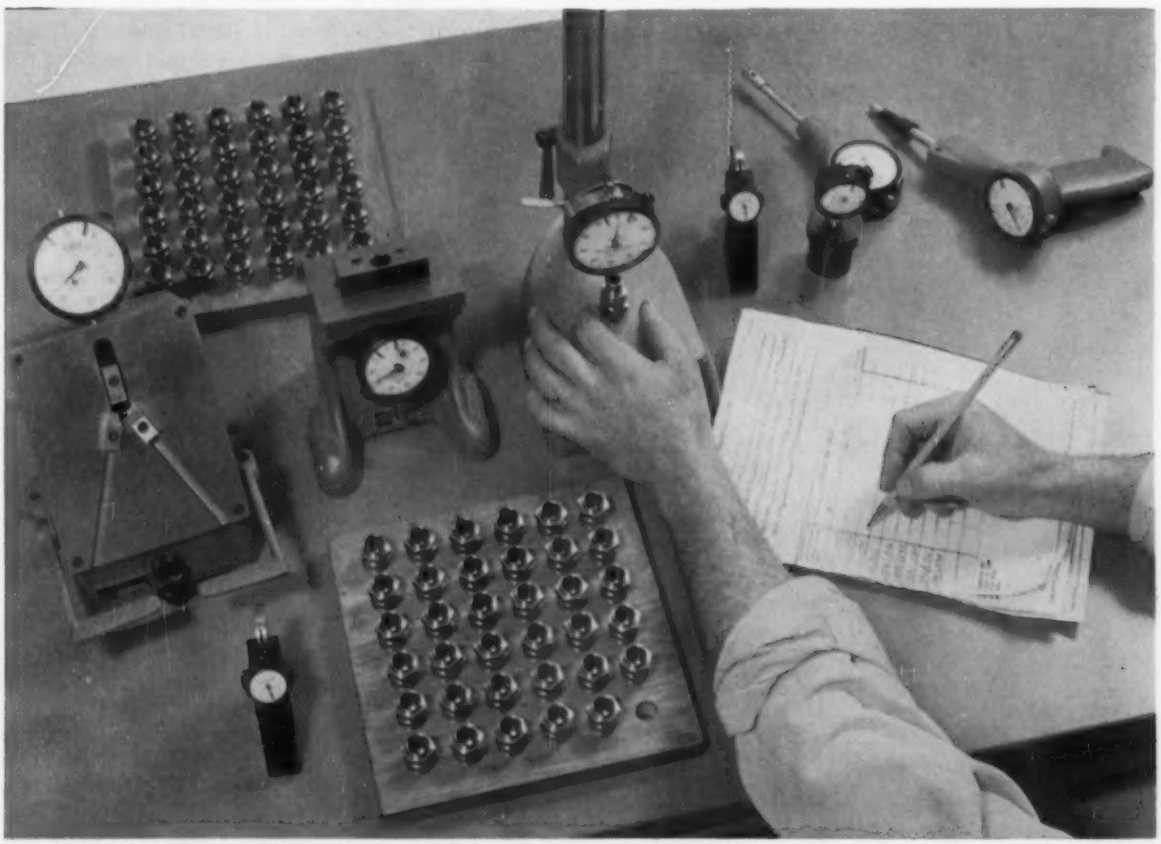
Cone Automatic Machine Co.—A Model TF, 1⅝ in., six-spindle bar Conomatic, plus operating personnel.

Jones & Lamson Machine Co., Comparator Div.—A 30-in. floor type optical comparator and measuring machine, arranged for 10 magnifications and higher, for inspecting spark-plug shell components and inspecting tool profiles.

Jones & Lamson Machine Co., Thread Tool Div.—Self-opening die heads and hollow mills.

Federal Products Corp. — A group of adjustable, mechanical gages covering the nine dimensional sizes of the shell, with tolerance-limit markings to indicate trends in machining-size control.

Wilson Mechanical Instrument Div., American Chain & Cable Co. —A Rockwell hardness tester to



QUALITY CONTROL: Federal gages check dimensions on spark-plug shells to insure quality in fast production.

check the hardness of bar stock and cutting tools.

Brush Electronics Co.—A Surfindicator for inspecting the surface finish of workpieces and tools.

Black Diamond Saw & Machine Works, Inc.—A Model 3B precision drill grinder, with web-thinning attachment and an assortment of collets, for grinding straight and taper shank drills.

Edward Blake Co., Inc.—A No. 2 tap Chamfer grinder, with accessories, for sharpening leads on taps, reamers, countersinks and drills; also a flute grinder, with built-in coolant system, diamond wheel-dressing device, and collets.

Lincoln Engineering Co. — An electrically-timed central lubrication system, installed on the Conomatic, to insure proper lubrication of machine components.

Royal Oak Tool & Machine Co. —A universal form relieving tool grinder.

Abrasive Machine Tool Co.—A No. 3B horizontal-spindle surface grinder.

Jones & Laughlin Steel Corp.—Type A leaded steel bars, 13/16 in. hex form in 12-ft lengths, as basic material for the spark-plug shell.

Firth Sterling, Inc.—High-speed steel, cast alloy, and carbide materials to be used as required for form tools, cut-off and facing blades, tool bits, and shaving, recessing and trepanning tools.

John Bath Co., Inc. — Ground thread taps.

Cleveland Twist Drill Co.—Cleforge drills, also necessary counterboring and reaming tools.

Scully-Jones & Co.—A Toolitrol control board, with preset-type, quick-change tool holders and accompanying gages. This unit serves as a station where dull tools are exchanged for sharpened and preset replacements, and through which all tools are routed.

Gulf Oil Corp. — Necessary greases, lubricants, and coolants.

EXCHANGE CENTER: Scully-Jones Toolitrol board is already proving that preset, quick-change tools save time and money.

Some Results Already — Studies on the spark-plug shell are well underway. Under the optimum conditions prescribed at present, cycle time for machining the workpiece has been whittled down to 4.41 seconds.

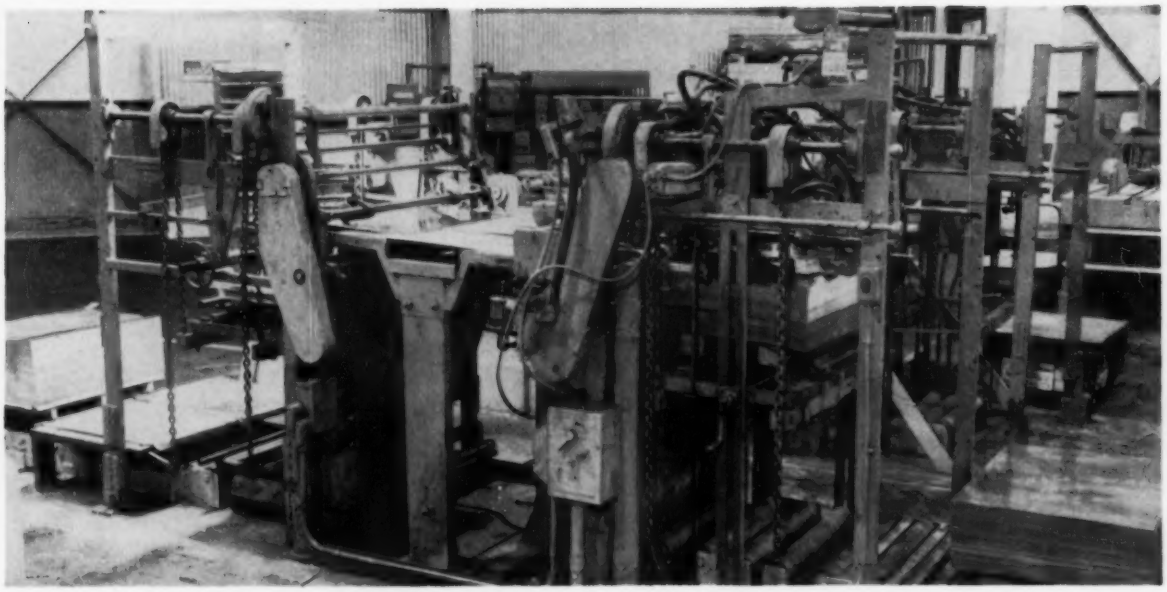
Perhaps an even more important factor is the time saved in removing dull tools and replacing them with sharp ones, preset in their quick-change holders. Time for a complete change at present is only 5 minutes 42 seconds. COMAPRO technicians estimate it would take 42 minutes 35 seconds to remove and replace the same tools if conventional holders were used.

Thus, in the 37 minutes of tool-replacement time that are saved, the machine turns out an additional 503 spark-plug shells.

Detailed Advice—This is the type of good-practice information that COMAPRO intends to accumulate in detail. Moreover, its reports will include tips on all manner of things not directly related to tool geometry and time cycles. Even such side benefits as the advisability of cleaning bar stock before it's machined will be part of the overall project report.

A companion project to the spark-plug shell study will begin soon. This one involves a bushing to be made of leaded 8630 steel supplied by Joseph T. Ryerson & Son, Inc. The other sponsors will again furnish whatever types of products are needed.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



COUNTING MADE EASY: Photo-electric unit keeps record as sheets are automatically fed to conveyor.

Feeders Lengthen Sheet Runs

Even if the line is mechanized itself, a sheet process depends on feeding for overall efficiency.

Here's a feeding unit that adapts to many processes. And the newer models feed more sheets per run at higher rates.

▪ Sheet feeding and stacking can be the key to efficiency in many sheet processing techniques. That's the case with one firm, The Tennessee Coal & Iron Div., U. S. Steel Corp., Fairfield, Ala.

The feeding units at T C & I were manufactured by The Dexter Co., Div. of Miehle-Goss-Dexter, Inc., Pearl River, N. Y.

Serves Slitters — As the feeder elevator raises the load to feeding position, an automatic pile-height governor indexes the load upward as sheets are fed off. While suction cups lift the rear edge of each sheet, a blast of air is blown under it to complete separation from the pile.

Suction cups near the front end lift and pivot, advancing each sheet between friction rollers for delivery to the slitter conveyor. Each of the six slitting lines trim 78 sheets per minute.

For supplying the feeders, an overhead crane positions sheet bundles weighing 3500 lb on standby roller conveyors. When the preceding bundle has been fed off, the elevator platform is lowered, the empty pallet is removed, and the new bundle is rolled into place.

Fits in Oiling Setup—Each of three oiling lines is comprised of a Dexter feeder, an oiling unit and a drying oven. As the sheets emerge from the feeder, a reciprocating pipe sprays the sheets with a mixture of oil and naphtha. The naphtha increases the spreading power of the oil and is then evaporated in the drying oven.

Sheet bundles, destined for the oiling machines, are supported on special carriers. These rectangular carriers are formed of four pipes, welded at the corners.

To reduce loading time, one bundle is placed on top of another. When one bundle is fed off, the blocks separating the two bundles are simply removed and feeding continues.

Feeds Electronic Counter — The counting machine is made up of a feeder, photo-electric counter and piler. Sheets are electronically counted and delivered to the piler. Working in reverse of the feeder, the piler indexes the load downward as it accumulates sheets.

Operation has justified a second unit, now being erected. The new counter with late-model feeder will deliver up to 150 sheets per minute and will support loads up to 9000 lb. Present feeders generally deliver less than 100 sheets per minute and support loads of 6000 lb.

The feeders on each of 16 tin lines are in duplicate or triplicate. This means the units are capable of feeding two or three sheets to the tin pots simultaneously, so that each pot can be used to capacity.

Improved Baths Solve Lifting Of Plated Circuit Foils

By **E. C. Rinker**—Technical Director, Sel-Rex Corp., Nutley, N. J., and **F. W. Jahns, Jr.**—Technical Sales Supervisor, Continental-Diamond Fibre Corp., Newark, Del.

Electroplating with gold or rhodium is an effective way to guard copper printed circuits against corrosion and wear.

The problem has been how to keep the plated foil from lifting in later service.

Ways have now been found in the form of new plating processes; they should find use in other fields as well.

▪ Most printed circuitry today uses a board made from a copper-clad sheet of plastic laminate. The copper (which may be bonded to one or both sides) is usually an electrolytically produced foil having a minimum purity of 99.5 pct, and ranges in thickness from 0.00135 (1.02 oz per sq ft) to 0.0094 in. (7 oz per sq ft).

Copper's electrical properties are nearly ideal for most printed circuits. But copper in the highly pure state is also very vulnerable. Oxides are apt to form during storage prior to processing; this requires more corrosive fluxes before dip soldering, which in turn may mean further attack when the circuit is in service.

In addition, many printed-circuit applications involve high temperatures, high humidity and corrosive atmospheres. There's also the problem of wiping or sliding electrical contacts causing accelerated wear on the copper.

Plating Methods For Printed Circuits

Silver, flash immersion. For short-term protection against corrosion.

Silver, electroplated 0.0005 to 0.002 in. Provides good slow-speed switch contact surface.

Lead-tin solder (40 pct Pb, 60 pct Sn), electroplated 0.0005 to 0.002 in. Gives excellent soldering aid, acceptable for plug-in finger contacts, but subject to oxidation and attack by corrosive fluxes.

Gold, flash immersion. Provides protection against corrosion and is a soldering aid.

Gold, electroplated 0.0001 to 0.0002 in. Gives excellent electrical, soldering, and wear-resistant surface for sliding and wiping contacts.

Nickel-gold plate, 0.0005 to 0.0007 in. nickel and 0.00001 to 0.00005 in. gold. Gives good soldering, noncorrosive, low-contact resistance, nonwiping contact surface.

Nickel-rhodium, electroplated; 0.0005 to 0.0007 in. nickel, 0.000005 to 0.000040 in. rhodium. For hard, noncorrosive, wear-resistant wiping contact surface (commutators and wiping switches), for continuous or intermittent operation.

Needs Protection—If any of these conditions are likely, the copper conductor pattern has to be plated. This may be done either before or after the circuit design is etched. It's simpler and more efficient, however, to plate the copper before etching.

The more popular types of plating in current use include silver, gold, lead-tin solder, nickel-gold, rhodium, and nickel-rhodium. Of these, gold and rhodium have proved most ideal.

Gold's resistivity is only slightly less than copper's; it's the third best conductor after silver and copper. A fine-grained, dense and homogeneous metal, gold gives precise definition of the smallest lines in miniaturized circuitry. It has high resistance to oxidation and tarnishing, and is unaffected by most chemicals. No soldering fluxes are needed, and the smooth, hard surface of bright gold gives excellent wear resistance for sliding or wiping contacts.

Rhodium or nickel-rhodium are specified when circuit elements are subjected to exceptional wear or friction. Rhodium's extreme hardness is combined with low electrical resistance and high tarnish- and corrosion-resistance. Until recently, however, it posed certain difficulties because of its high as-deposited stress.

Peeling Posed Problems—One of the problems in plating printed circuits with precious or semiprecious metals has been lifting or peeling of the copper foil after the circuit has been placed in service. This was partly due to earlier use of hot

cyanide solutions (140 to 160°F), laminates that weren't properly processed or cured, and inadequate bonding resins. A further cause of lifting was the high tensile stresses in undercoating metals such as nickel.

Potassium cyanide was orginally used in the plating solution because it dissolves gold and silver in very dilute water mixes and so speeds electrolytic action. But even with top-quality laminates — unless of cyanide-resistant construction—the chemical reaction of the residual cyanide on the adhesive bond, due to the high temperature of solution, caused lifting.

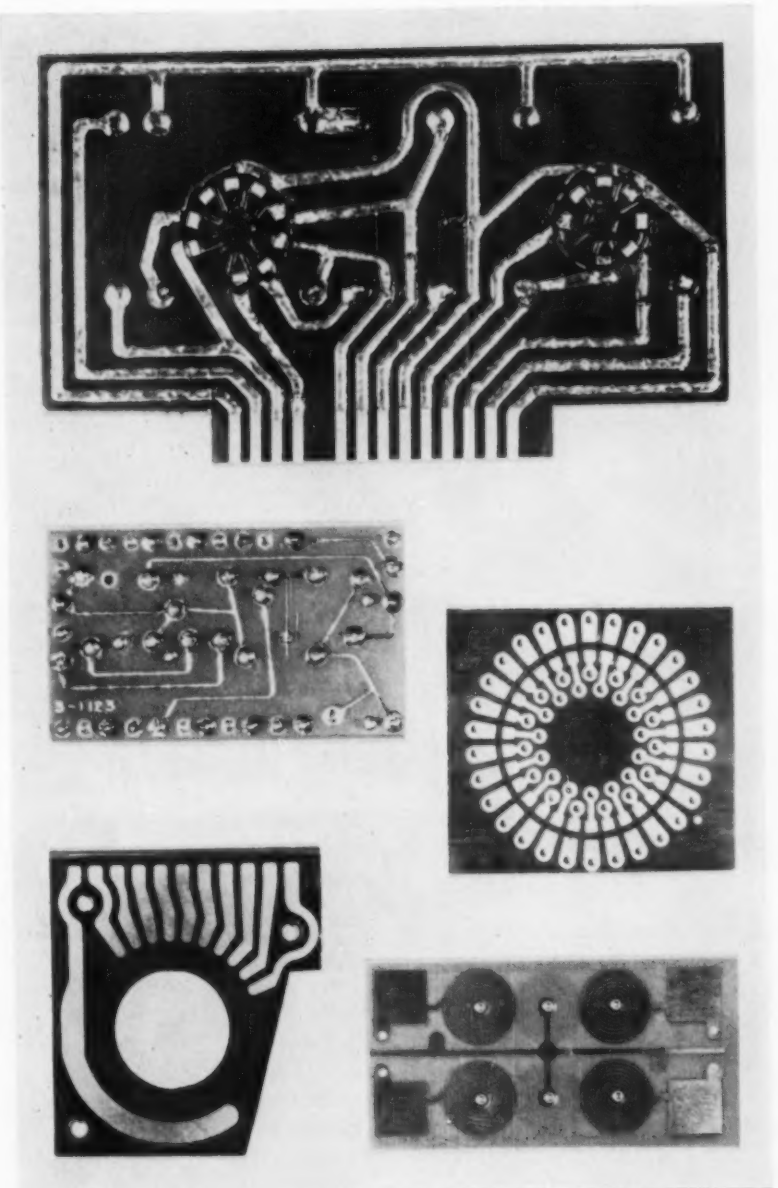
A joint study of this problem was made by Continental-Diamond Fibre Corp., manufacturer of plastic laminates, and Sel-Rex Corp., precious-metals electroplating engineers. Results of the study thus far have been the development of three new methods of electroplating printed circuits that eliminate lifting.

Prime Offender—Assuming the proper grade and quality of plastic laminate base, it was found that hot plating solutions and cleaning agents are big factors in printed-circuit failures. Hot solutions may deform the laminate, deform the resist, soften the adhesive or resin binder between copper foil and laminate, and penetrate the laminate structure to leave a residue. When moisture is present, cyanide residue can cause short circuits.

The Sel-Rex bright gold plating method, introduced to printed circuitry in 1955, lowers the temperature of the potassium cyanide bath to between 44 and 90°F, with a median range of from 60 to 70°F for optimum results.

The process eliminates buffing and scratch-brushing losses, and provides high throwing power and uniformity of deposit. The bright deposits are hard and thus very wear resistant.

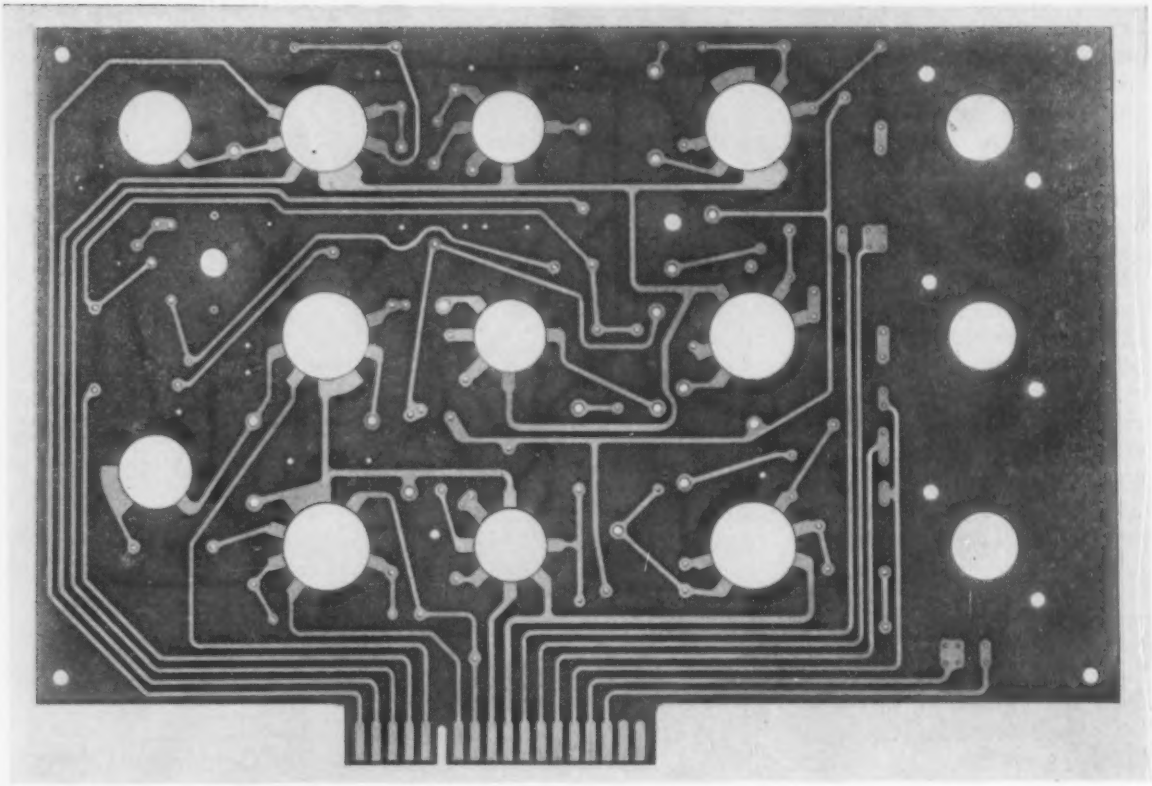
Greater Protection — Moreover, bright gold deposits are denser than conventional gold plate, because of the fine-grained, preferentially oriented crystal structure; as a result, much less gold is needed to meet a particular service requirement. Tests have shown that the cold-solution bright gold process gives 40 pct more protection against wear and abrasion (for equivalent thicknesses of gold) and 6 times more corrosion protection (with ¼ the amount of gold).



FOR WEAR RESISTANCE: Plating is particularly important on circuits where wiping or sliding contacts would speed wear of the copper foil.

Because the bath isn't heated, cyanide decomposition is slow; this means a marked decrease in residual cyanide attack on the photo resist, the laminate, and the adhesive bond between copper and laminate.

Although cyanide-resistant laminates are available, their cost may be a big factor in certain printed-circuit applications. Even though the cold-solution process greatly reduces cyanide attack, there's still a possibility of failure at the copper-



STAYS BONDED: New processes for plating gold and rhodium on print-circuits assure that copper foil won't separate from the plastic-laminate base in later service. Lower bath temperatures improve plating adhesion.

laminate interface if the laminate isn't cyanide-resistant.

Creates Acid Bath—To overcome this problem Sel-Rex developed its Acid Bright Gold plating process. The new method uses a mildly acid electrolyte (pH 3.5 to 4.5) that has no free cyanide, and which plates at room temperature. Neither the laminate nor the adhesive at the interface is affected during plating, and lifting due to cyanide attack becomes impossible.

Other advantages of the acid gold process are that the less expensive grades of paper-base phenolic laminates can be used, without the need for cyanide-resistant treatment; abrasion resistance is increased about 75 pct over conventional gold plate; acid gold plate is extremely fine-grained and evenly distributed over the foil, regardless of deposit thickness; and the electrolyte is simple to prepare and maintain.

Moreover, the new process also eliminates the need for the flash strike normally used when bright gold is plated over nickel, brass, nickel-silver or copper—thus avoiding the possibility of damage to the photo resist by exposure to a warm cyanide solution.

The acid gold process gives higher wear and abrasion resistance; thus, for the same wear requirements, thickness can be considerably reduced, lowering gold cost. Actually the process requires less gold for the same thickness, so a double saving results. Diamond-point hardness for acid gold is 300 to 325 (about 300 on the Vickers scale).

The bright gold plate averages from 2 to 7 times less porosity than conventional gold plate. The thicker the bright-gold coating, the more protective it becomes, and the higher is its relative freedom from porosity.

Improved Rhodium Plating — Hitherto the problem with rhodium plating of printed circuits lay in its high tensile stress and crack structure. Internal stresses of rhodium plate often exceed bond strength of the copper-laminate.

To overcome lifting from this source Sel-Rex has come up with a process known as Rhodex plating. It introduces certain inorganic stress reducers that keep stresses in the rhodium deposit low and make them compressive rather than tensile. As a result, the coating actually clings to the copper laminate.

The low compressively stressed deposit does away with cracks and fissures, which insures maximum corrosion resistance and reliability under high fatigue conditions; and, more important, it eliminates noise —a common bugaboo in stress-cracked rhodium deposits. Even in extra-heavy deposits, such as those required for switching contact service, the Rhodex deposit stays smooth and fine-grained.

Automated Molds Mass-Produce Precision Rubber Parts

Where rubber parts demand precision molding, a new process can help avoid paying a premium for close tolerances in volume production.

Key to economy is the mechanization of quality molds to reach high output.

▪ A new process molds rubber parts to precision dimensions without the premium cost usually paid for tolerances. The production method has just been put into operation at the Stratford, Conn., plant of the Ohio Rubber Co., Div. of Eagle-Picher Co.

Because of the high degree of mechanization, costs for the custom-molding process are no greater than those of conventional molding methods. The operator has only to keep the machine supplied with compounded stock and to remove containers of finished parts. He loads stock onto plasticizing rolls from which it is fed into the rotary molding portion of the machine.

Individual Molds—Mounted on a rotating wheel, each mold takes the amount of material it needs, carries it through the molding and curing stages, discharges the finished part, and returns for more stock. Molding time, temperature, and pressure are all under automatic control.

One machine can produce from 40,000 to 200,000 pieces per day from the single-cavity self-registering molds. Under special circumstances, production rates can be higher.

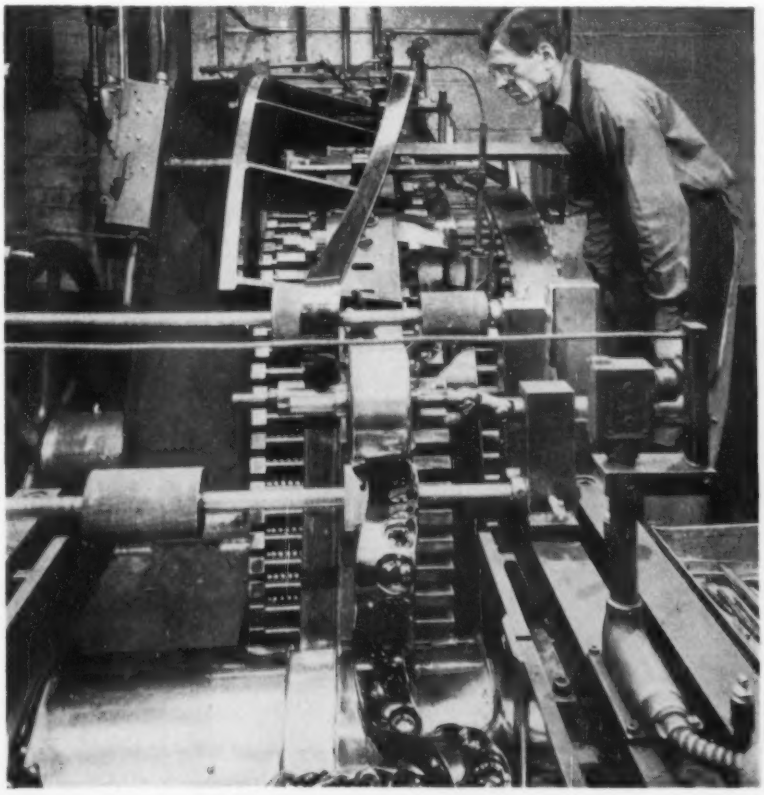
With present methods and equipment, the process is best suited to volume output of small parts that are functional and need quality material. Quantities of a million or more pieces annually will be required in most cases to amortize tooling costs.

Check Tolerances — Accuracy equal to or better than that obtainable by any other rubber-forming process is routine. Diameters can be held to within ±0.003 to 0.005 in. depending on size.

A critical dimension on one part now in production is being held within ±0.0025 in. On another part with a thin section and large diameter, surfaces are produced parallel within 0.003 in. Accuracy is about the same for fixed or closure dimensions, because flash is so precisely controlled.

Maximum dimensions with present equipment are 1¼-in. diam and 1-in. thickness. Larger pieces can be molded at lower production rates.

Seals and Washers—Typical of parts suited to the new process are precision seals for automotive shock absorbers and universal joints, engine valve stem deflectors, washers for water conditioner quick-connectors, electric condenser caps, and aerosol container valve parts. Most of these parts were formerly produced by precision compression-molding methods because of their dimensional accuracy requirements. The new process turns them out with equal or greater accuracy and at substantially lower cost.



CONTINUOUS PROCESS: Ribbon of compound feeds from plasticizer (foreground) to molding section (background), as punched stock is returned.

Combine Nitriding, Induction

It is possible to increase the nitrided case hardness of 4340 from Rc 57 to Rc 64 in just two seconds.

High-frequency induction heating provides additional diffusion of nitrogen and an extra-hard, wear-resistant case.

By P. M. Unterweiser—
Metallurgical Editor

▪ When most low-alloy, high-strength steels are nitrided — even under optimum conditions—a maximum surface hardness of about Rc 58 is about all that can be expected. Even Rc 58 is slightly on the high side and cannot always be obtained consistently on a production basis.

Add to this the fact that when finish grinding or lapping is needed, final surface hardness can be counted on to be even lower. In many engineering applications, this limitation severely curtails the usefulness of the nitriding process on the more popular low-alloy steels other than Nitralloy grades.

Commercially Feasible — Is it possible to greatly increase the nitrided case hardness of a widely used steel such as 4340? Further, is it possible to increase case hardness to a degree where the results approach those normally obtained only with Nitralloy steels?

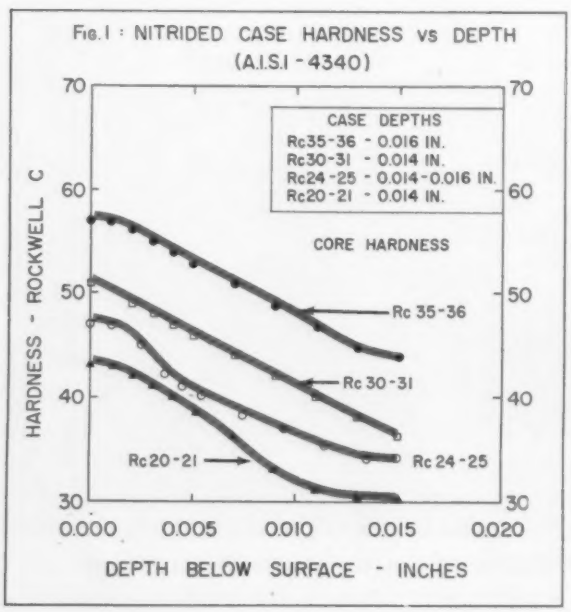
Preliminary results of a recent test program indicate that such improvement in case hardness can be obtained in a manner that is commercially feasible. Surface hardness of nitrided 4340 was actually increased from Rc 57 to Rc 64 in a matter of seconds. The higher hardness was not lowered by a subsequent one-hour tempering (or stress-relieving) cycle.

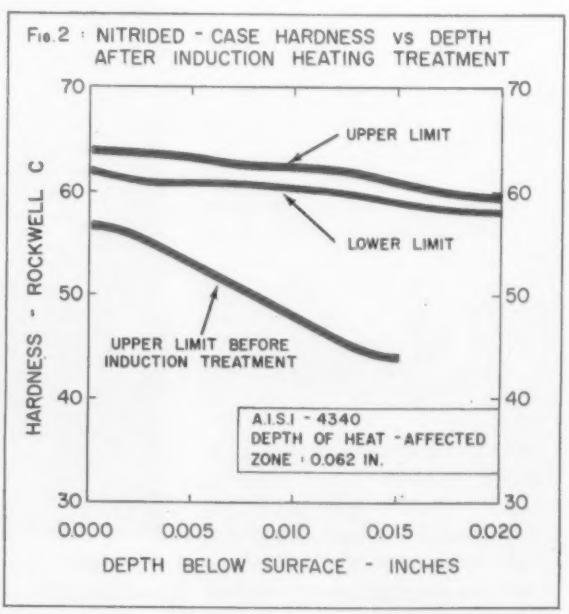
New Combination — These unusual results were obtained by combining conventional nitriding practice with a high-frequency, induction heating cycle. In a matter of seconds, induction heating served two major purposes. It more evenly diffused nitrogen in the nitrided case. At the same time, it provided sufficient surface temperature for hardening in oil.

Current in-put at extra-high frequency was intentionally chosen for the experiment in order to limit the heat-affected zone to approximately the nitrided-case area. These conditions were obtained with an Inductron high-frequency induction heating unit manufactured by the Meta-Dynamics Div., Cincinnati Milling & Grinding Machines, Inc., Cincinnati.

Chose 4340—Although any one of a number of chromium-containing, low-alloy steels might have been chosen for test purposes, 4340 was decided upon because its nitriding characteristics are well known. Its performance in the nitrided condition has been adequately tested, particularly in aircraft.

Test specimens were machined from 1 in. diam bar stock. All were copper plated and hardened under protective atmosphere. After hardening, samples were tempered to produce four "core" hardness levels: Rc 20-21, 24-25, 30-31, and 35-36. All specimens were inspected after tempering and found to be free of any surface decarburization.





Hardening on Low-Alloy Steel

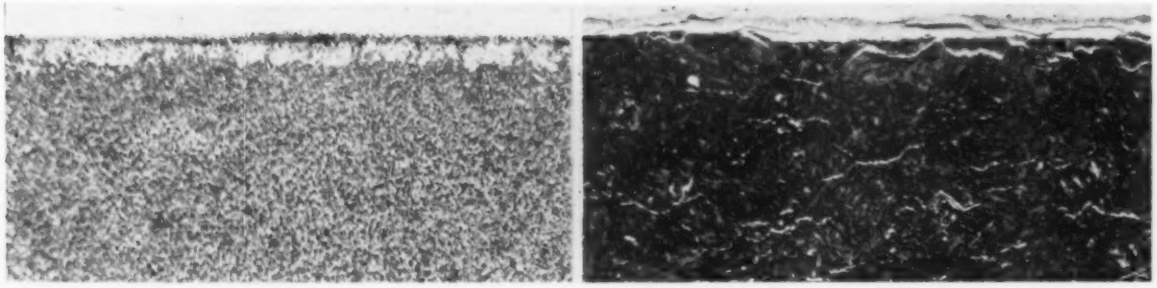


FIG. 3: At left is the typical microstructure of nitrided 4340 (mag. 500X). The nitrides appear as white stringers distributed throughout the case area. At the right is the microstructure of the same nitrided steel after induction treatment (mag. 100X). Note the diffused white layer near the surface of the specimen. This apparently accounts for the fact that a high case hardness can be maintained to a depth of 0.020 in.

Nitrided First — The core hardness levels were chosen in order to first determine the effect of core hardness on nitrided-case hardness. A maximum hardness of Rc 35-36 was not exceeded because the tempering temperature required to produce this hardness was safely above the nitriding temperature. Consequently, there was no chance of specimens altering their core hardness during the nitriding cycle.

To insure an optimum nitriding surface, all specimens were cleaned and bonderized prior to nitriding. They were then nitrided at 975°F for 25 hours in a single-stage cycle. Rate of ammonia dissociation was maintained between 20-30 pct throughout the cycle.

Average Results—Hardness measurements for the nitrided cases at four core hardness levels are shown in Fig. 1. The Rockwell C values plotted were converted from actual 15N readings. These values are about average for nitrided 4340. As might be expected, lower core hardness resulted in lower case hardness.

Such a condition is normal. According to Hodgson & Waring, "the preliminary heat treatment to which a steel has been submitted may influence considerably the maximum hardness attained during nitriding." Essentially, this means that surface hardness of a nitrided case can be expected to vary directly as a function of core hardness.

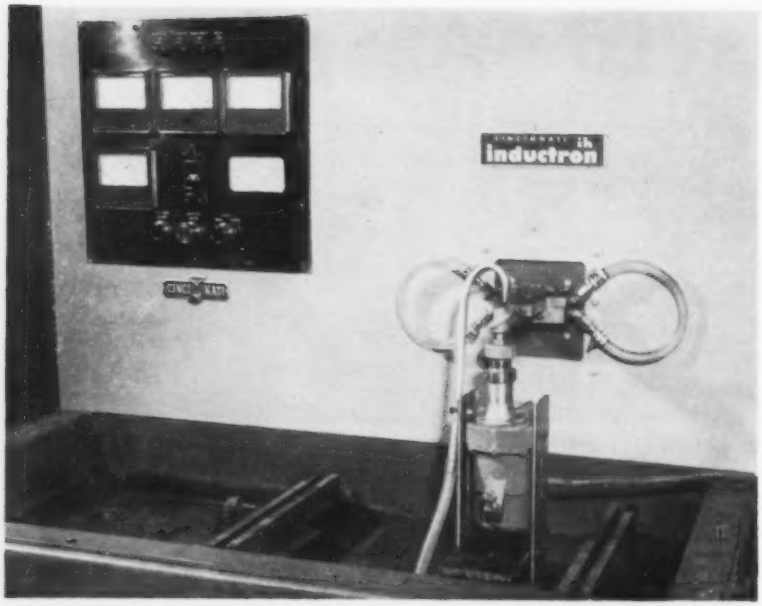
Then Induction—After nitriding, all specimens were subjected to the same induction heating cycle. This consisted of heating to 1600°-1650°F in 2½ seconds and quenching in oil. Time at maximum temperature was not measured but could not have exceeded a small fraction of a second.

Capacity of the Inductron heating unit used is 30 kw. Its operating frequency is approximately 1200 kc. The inductor used consisted of two turns with an ID measurement of about 1⅛ in. This coil heated a length of about 2 in. of the 1 in. diam specimens.

Higher Hardness — There is no precedent for a tempering or stress relieving cycle that should be used after induction hardening a nitrided steel. Still, it was felt that some stress relief would be advisable. Consequently, all test specimens were held at 400°F for one hour and air cooled.

Surface hardnesses for all specimens were in the range of 15N 90-92. The highest surface hardness was obtained on those specimens

FIG. 4: After induction hardening, a perfectly concentric case area can be seen on the nitrided specimen. Heat affected zone extends to 0.062 in.



HIGH-FREQUENCY: The Inductron unit operates at a frequency over 1 megacycle. Its power output is rated at 30 kw. The high frequency is particularly suited to shallow case hardening.

with a core hardness of Rc 35-36.

Even at the lowest core hardness level (Rc 20-21), a minimum surface hardness of 15N 90 was obtained. This is the equivalent of Rc 62 and represents an increase over nitrided surface hardness of almost 20 points Rockwell. The maximum spread in surface hardness due to core hardness was cut from 14 to 2 points Rockwell.

Good Depth—Fig. 2 plots the range of hardness values obtained as a function of case depth. The upper limit of case hardness values were obtained with the Rc 35-36 core hardness. All case hardness values fell within the spread shown, even at the lowest core-hardness level. The depth of heat-affected zone due to induction heating was 0.062 in.

At the upper limit of case hardness, a hardness of Rc 60 or over is maintained to a depth of almost 0.020 in. A minimum of Rc 60 is held to a depth of 0.012 in. at the lower limit. In both cases, the results are most unusual and are due to a change in case structure.

Diffuse Nitrogen — Photomicrographs (Fig. 3) indicate that the nitrogen content of the original nitrided case was diffused inwardly as a result of induction heating. Note the broad, nitrogen-diffused layer contained in the induction-heated structure. These specimens were etched in 2 pct Nital for 30 seconds.

High - frequency induction hardening of nitrided 4340 serves two major purposes. It tends to greatly lessen the normal effect of core hardness on case hardness. Also, it produces an extremely high surface hardness and extended depth of hardness.

What produces the extra hardening effect?

Three Elements—In the conventional nitrided case, the ability of the alloying elements to form carbides is known to influence case hardness. As the tempering temperature is increased, more and more of a carbide-forming element is precipitated as a carbide, leaving less in solution in the iron for nitride formations. Nitralloy steels containing aluminum are not so markedly affected in this way, since all of the element remains in solution and is available for nitride formation.

Depending upon the amount of precipitated carbide in tempered 4340, nitrided case hardness can vary within a fairly broad range when the steel is nitrided in the conventional manner. It apparently cannot exceed a maximum hardness of about Rc 58 because too much of the carbide-forming elements have already been precipitated prior to nitriding.

Forms Nitrides — A short (2-3 second) induction heating cycle at high frequencies raises the surface temperature of the steel to 1600°-1650°F momentarily. Evidently, this treatment is sufficient to place carbides back into solution, thus releasing the carbide-forming elements for further chemical combination.

In the presence of nitrogen contained in the nitrided case, this permits the formation of additional nitrides and results in an appreciable increase in case hardness.

Other Prospects — Although the present tests were limited to 4340, it can be expected that comparable results will be obtained with other chromium - containing, low - alloy steels. Likely prospects include medium-carbon grades of the 4100, 5100, 6100, 8600, 8700, 9300, and 9800 series. British steels of the EN-24, 25, 26, and 110 series should also show similar response.

The fatigue properties and other important mechanical properties of nitrided - induction - hardened steel have not yet been determined.

References:

C. C. Hodgson and H. O. Waring, Transactions Iron and Steel Inst., Dec. 1944

Ivor Jenkins, "Controlled Atmospheres for the Heat Treatment of Metals," 1951

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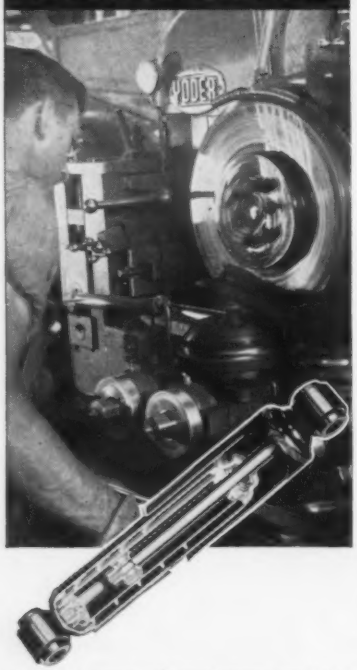

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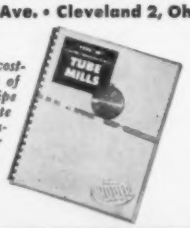

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Batteries for control, switchgear and auxiliary power uses are featured in a 4-page folder. They have a high-tensile alloy grid. (C & D Batteries, Inc.)

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How products of corn enter into industrial manufacturing processes is the subject of a 64-page booklet. Interesting and informative, it is non-technical. Yet, it could make a good reference for advanced engineers and specialists. (Corn Industries Research Foundation.)

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A carloading check chart for anchored loads aims at shipping and loading dock personnel. It covers carloading procedures using steel strapping tools. (Signode Steel Strapping Co.)

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Manufacturers of corrugated steel riveted culvert pipe, as well as designers and engineers, are aimed at in a 76-page booklet on drainage problems. Its publisher is not a pipe fabricator, but a producer of a special copper-bearing steel for culvert pipe service. (For free copy, write

on company letterhead to Publications Dept., Bethlehem Steel Co., Bethlehem, Pa.)

Computer Method

A 4-page bulletin describes unusual features of a new programming method for computers. It can be learned in a few hours or less by persons with no previous computer experience. (Bendix Computer Div.)

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A new catalog explains principles of an automatic lathe using a large horizontal table upon which the tool carrying slides can be placed to best advantage. Number of possible tooling arrangements is almost infinite. (Gisholt Machine Co.)

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Cutting Fluids

Cutting and grinding fluids and how to choose the right one for a particular job are discussed in a 12-page booklet. Including a machineability rating chart, it analyzes oil-type and water-type fluids for all types of machine tools and grinders. (Keystone Lubricating Co.)

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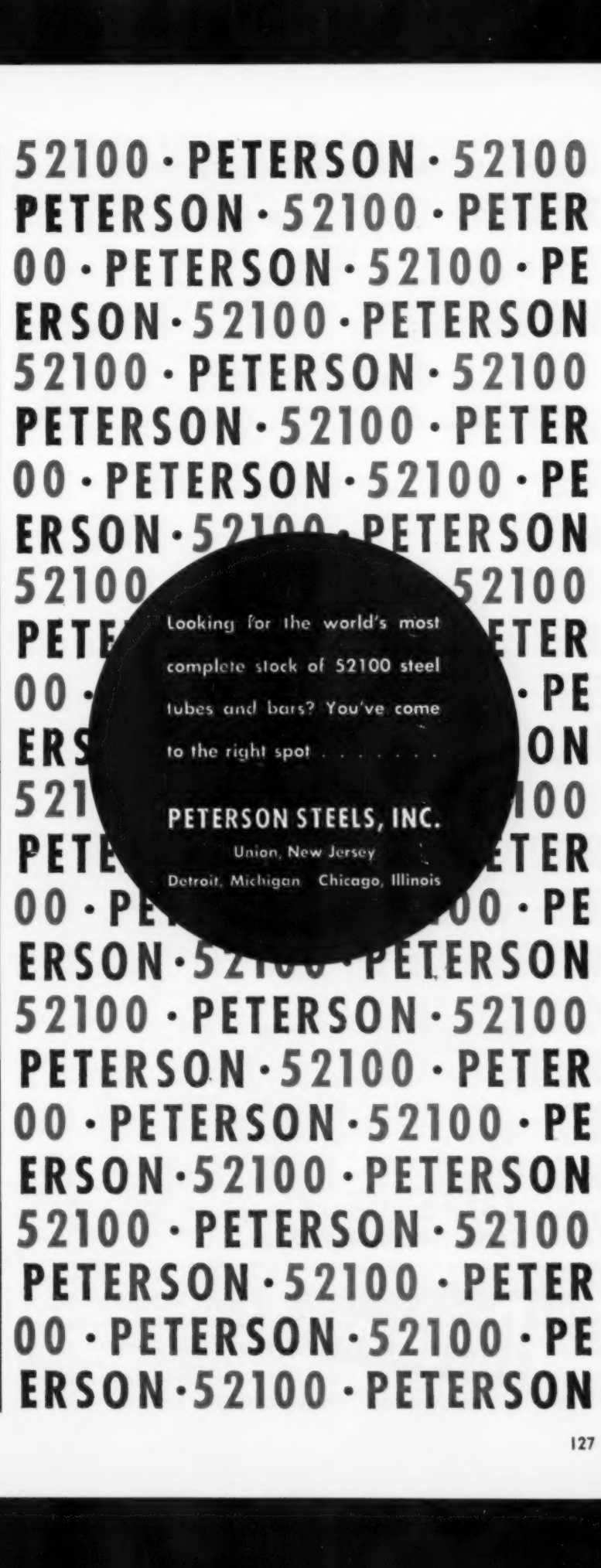

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For free copy circle No. 17 on postcard p. 131

Six-spindle Unit

Designed for high production, a 6-spindle, power indexing machine has individual pre-selective spindle speeds. Its use can cut handling time by providing six different jobs on one unit. (Burg Tool Mfg. Co.)

For free copy circle No. 18 on postard p. 131

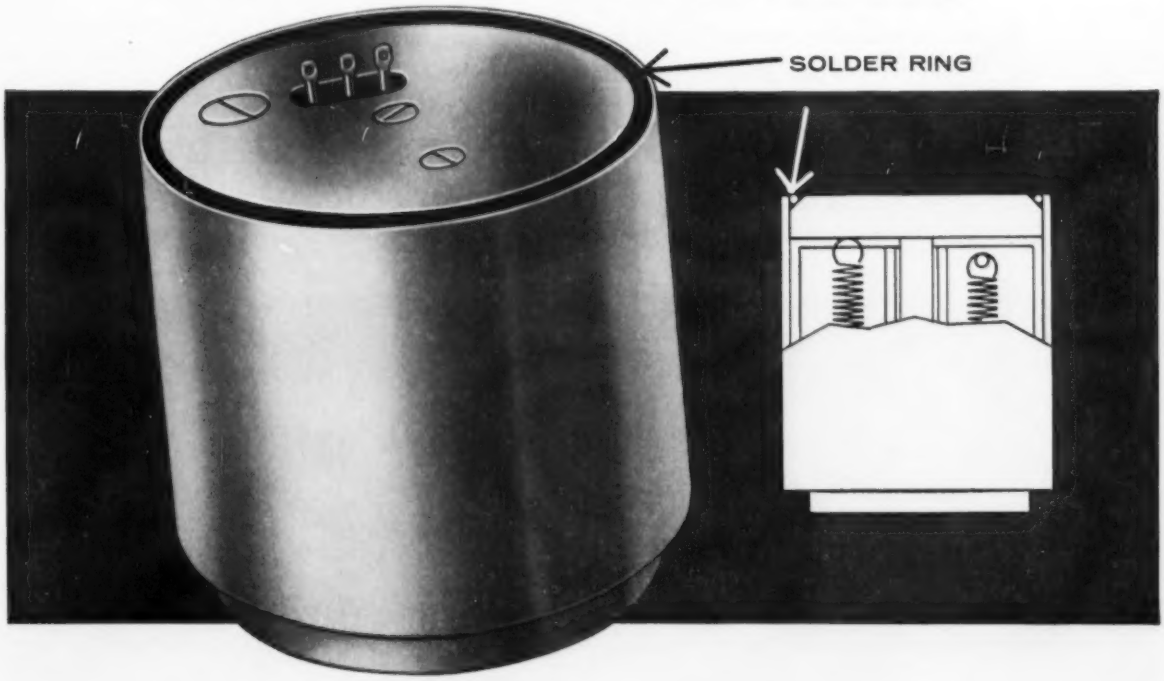
Clutches, Couplings

Uses of slip clutches and couplings for industrial machinery are reviewed in a bulletin. Covered: speed reducers, conveyors, gearing, tension control. (The Hilliard Corp.)

For free copy circle No. 19 on postcard p. 131

Precision soldering 7 Times Faster...

with TOCCO Induction Heating*



When G. M. Giannini and Co., Inc., Pasadena, California, switched from old-fashioned methods to TOCCO Induction Heating they increased production of these high-precision accelerometers from 4 to 30 per hour—with a commensurate *decrease* in production costs.

Here's what a Giannini official has to say about the TOCCO installation: "Prior to using TOCCO for this purpose, we had tried soldering irons, normal torches, resistance sealing, and even threaded screw fittings, with uniformly poor results. Essentially, the TOCCO unit has permitted us to build, in production quantities, oil-filled hermetically sealed units that could not be produced in any other way."

Whether your production bottleneck involves soldering, brazing, heat treating or heating for forming it pays you to investigate TOCCO as an economical way to do it better, faster and at lower cost.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. A-6, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering".

Name_____

Position_____

Company_____

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City_____ Zone____ State_____

waiting to fill your orders... as soon as we receive them!

You can consider this your stock of bolts, nuts and screws.
Actually, of course, they're stocked at The Lamson & Sessions Co.;
but they're so readily available, and delivery's so fast, you can get them just about as quickly as from your own warehouse.
So phone, wire or write. Your fastener orders will be on their way immediately . . . from the largest selection obtainable!

The Lamson & Sessions Co.

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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Welding Electrode

You can weld manganese bronze and yellow brasses without preheating with a new welding electrode. It can be applied to the piece at room temperature. This eliminates costly preheating. (Ampco Metal, Inc.)

For free copy circle No. 20 on postcard

Machine Tools

Precision machine tools of many types, styles and sizes are reviewed in an 80-page catalog. Among others, it outlines lathes, millers, shapers, drill presses, and grinders. (South Bend Lathe Works.)

For free copy circle No. 21 on postcard

Particle Analyzer

A particle size analyzer is covered in a bulletin. The 4-page bulletin presents a new low-cost, general-purpose instrument for 0.1- to 40-micron particles. (Mine Safety Appliances Co.)

For free copy circle No. 22 on postcard

Meehanite Castings

"How to Machine Meehanite Castings" provides useful information on exactly what its title implies. (For free copy write on company letterhead to Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.)

Electron Microscope

An electron microscope is described in a 6-page folder. It explains the instrument's electron optical system, filament replacement, lens system and viewing screen, vacuum system, power supply, and operation. (Philips Electronics, Inc.)

For free copy circle No. 23 on postcard

Quick-action Vise

A new quick-action vise holds work for milling, drilling, assembly, etc. An eccentric handle and quick-acting cam lever team up to allow fast, positive holding and release of work. Literature describes it. (Fenn Mfg. Co.)

For free copy circle No. 24 on postcard

Teflon Tape

Low friction, non-stick uses of pressure sensitive Teflon tape and thermal curing, pressure sensitive Teflon impregnated fiberglass tapes are covered in a new 2-page data sheet. Tapes cover an application temperature range of —100°F to °500F. (Connecticut Hard Rubber Co.)

For free copy circle No. 25 on postcard

Specimen Machine

Equipment described in a brochure rapidly, accurately machines test specimens. It handles foil, sheet and plate. Cutting up to 20,000 rpm, it works a wide range of metals from aluminum to cobalt-base alloys. (Sieburg Industries, Inc.)

For free copy circle No. 26 on postcard

Fittings, Flanges

Seamless steel welding fittings are featured in a 48-page specifications catalog. It also covers forged steel flanges. (Tube Forgings of America, Inc.)

For free copy circle No. 27 on postcard

Globe Valves

Forged steel globe valves are outlined in a 4-page bulletin. Valves come in: ¼, ⅜, ½, ¾, 1, 1¼, 1½ and 2 in. sizes. (R-P&C Valve Div., American Chain & Cable Co.)

For free copy circle No. 28 on postcard

Pumping Units

Equipment for petrochemical en-

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/19/58

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FREE LITERATURE

gineering is featured in an 8-page catalog. It contains data of interest to designers and engineers in virtually all fields which involve pumping of materials or operational liquids. (The Mack Iron Works Co.)

For free copy circle No. 29 on postcard

Plastics

Industrial thermosetting laminated plastics are dealt with in a fabricator's brochure. Containing 28 pages, it gives data on sheets, rods, tubes and fabricated parts. (Synthane Corp.)

For free copy circle No. 30 on postcard

Truck Batteries

Silver-clad batteries for lift truck use are outlined in a 4-page folder. It describes a line of batteries that enable users to get more from their materials handlers. (C & D Batteries, Inc.)

For free copy circle No. 31 on postcard

Fittings, Flanges

Two technical data cards deal with buying and use of seamless welding fittings and forged steel flanges. (Tubular Products Div., Babcock & Wilcox Co.)

For free copy circle No. 32 on postcard

Flow Meters

Indicating flow meters are covered in a bulletin which gives ranges, scales, pressures, and mechanical details. Meters work with air, gas and liquids. (Seico Instrument Div., Eclipse Fuel Engineering Co.)

For free copy circle No. 33 on postcard

Furnaces

Gas-fired heat treating and melting furnaces and burners are dealt with in a new product bulletin. A highlight is a suggested, quiet operating, basic heat treating room layout with venturi equipped furnaces. This simply connects to available gas supply without any need for blowers or other power. (For free copy write on company letterhead to Charles A. Hones, Inc., 2475 Grand Ave., Baldwin, L.I., N. Y.)

Stainless

Some 34 standard grades of stainless steel are covered in a data chart. It contains a wealth of information for designers and fabricators. (Peter A. Frasse & Co., Inc.)

For free copy circle No. 34 on postcard

Welding Connections

In its dozen pages, a catalog describes one firm's complete line of arc welding cable connections and accessories. (Tweco Products, Inc.)

For free copy circle No. 35 on postcard

Mixing Agitator

Want to get help on picking the best agitator for a particular liquid batch mixing problem? A new selector dial may be just the thing. By turning the dial, you find recommended agitators. (Eclipse Air Brush Co.)

For free copy circle No. 36 on postcard

Couplings

New jaw type couplings included in a catalog's coverage have all-malleable construction. Other couplings, flexible and rigid, are reviewed. (Browning Mfg. Co.)

For free copy circle No. 37 on postcard

Closed-circuit TV

Closed-circuit industrial television systems are fully described in a pamphlet. (Insul-8-Corp.)

For free copy circle No. 38 on postcard

Heat Exchangers

Plate heat exchangers are described in an 8-page bulletin. It discusses inherent benefits, applications, and gives specifications and dimensions. (DeLaval Separator Co.)

For free copy circle No. 39 on postcard

Wean, Weirton and Tinning . . .

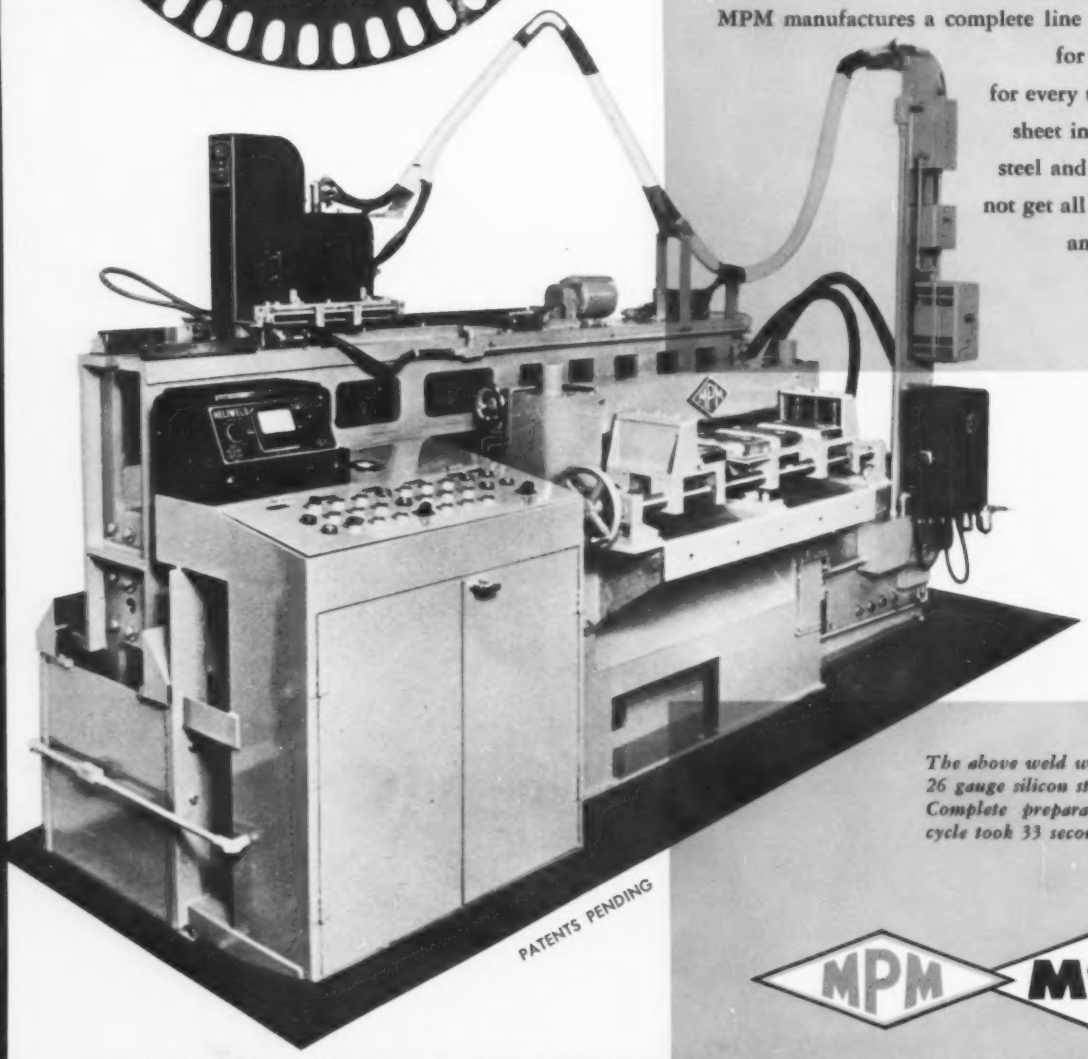
More than a city block long, this electrolytic tinning line is a true test of engineering precision. Through this line a continuous ribbon of steel travels at speeds up to 2000 fpm while being coated with a uniform layer of tin 30 millionths of an inch thick.
A Wean line is engineering precision at its best. Wean has engineered and constructed 47 electrolytic tinning lines.
These lines account for more than 75% of America's annual electrolytic tin plate production.

THE WEAN ENGINEERING COMPANY INC. • WARREN • OHIO

596

Silicon steel coil buildup made faster, more accurate by amazing MPM shearwelder

● The unretouched photo of the rotor lamination is a typical production butt-weld made on 26 gauge silicon steel by MPM's outstanding new Shearwelder. Perfect welds like this are a result of the exclusive positive guiding and clamping arrangement and welding technique developed by MPM engineers. Both shearing and welding are performed at the same station eliminating the chance for error that occurs when the work is moved from station to station, too, this MPM method speeds the operation. MPM manufactures a complete line of Shearwelders for every need, and for every type of strip and sheet including stainless steel and tin plate. Why not get all the facts on this amazing machine?



The above weld was made in joining 26 gauge silicon steel sheet 33" wide. Complete preparation and welding cycle took 33 seconds.

MPM McK

METAL PROCESSING MACHINE COMPANY • YOUNGSTOWN, OHIO

Subsidiary of THE McKAY MACHINE CO.

Standard Units Grind Special Drill Point

Interest in new drill point designs is running high. Newly engineered points are said to cut rejects, speed drilling and do a better job.

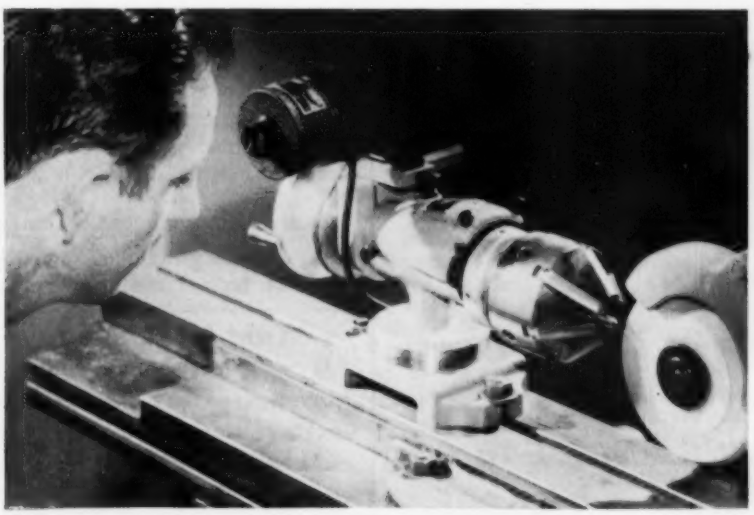
Now a grinding equipment firm has developed a fixture for making such points with standard surface or cutter grinders.

Mounted on a standard grinder, a new fixture permits grinding of special self-centering, free-cutting drill points. Ease and simplicity of operation are key features of the fixture; it allows generation of drill points that are said to have long life, high precision, and high output qualities.

Developed by Steptool Corp., Los Angeles, the fixture fits onto any conventional surface, tool, or cutter grinding machine. It produces a tool with a built-in centering drill which prevents "walking" of the drill on the workpiece. These tools have no side displacement, the firm reports. Thus, they make round, accurate holes free from "bell mouth."

No Center Drilling—In many cases, center drilling or center punching is unnecessary prior to drilling. Drill bushings to maintain accurate center location are also not needed. According to the point's developer, it eliminates need for unnecessary operations, reduces machining time, permits faster speeds and feeds, and reduces tooling and fixture costs.

Precision grinding, plus the drill's centering action, enable the tool to produce accurate holes with fine finishes. Lip concentricity and indexing can be held to ±0.0003 in. This means secondary opera-



Using a new fixture, this operator of a standard grinder not only produces new drill points, but grinds other tools, too.

Metal Stamping Facilities by Lansing
at your Service for...
ELECTRICAL EQUIPMENT
HOUSEHOLD APPLIANCES
TRANSPORTATION EQUIPMENT
INDUSTRIAL EQUIPMENT
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Lansing Stamping Co.
ESTABLISHED 1914
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PROMPT WAREHOUSE SERVICE ONLY
Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL
We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

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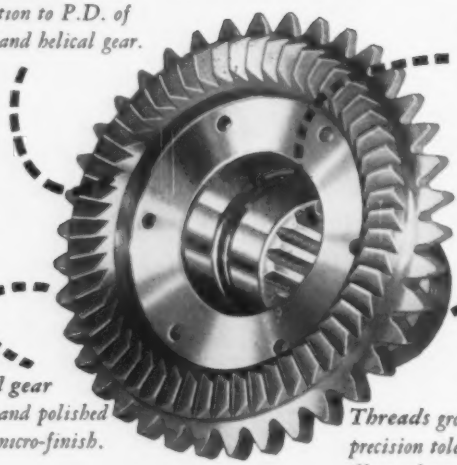
Generated clutch
held at close tolerance in relation to P.D. of spline and helical gear.

Involute spline, precision tolerance, uniform throughout, burr-free finish.



Helical gear ground and polished to #24 micro-finish.

Threads ground to class 4 precision tolerance. Close tolerance held between thread and P.D. of helical gear.

DON'T GAMBLE WITH GEAR PERFORMANCE

YOU know that gambling with gears can cost you money — production delays, costly rejects, failures in use. You don't want to take chances with your customers . . . they expect day-in, day-out performance from your machines. Your performance guarantee can be Perkins custom-cut gears . . . precision gears made to your exact specifications. Perkins' 52 years of gear-making know-how, extensive facilities and equipment, and rigid production controls assure uniform tolerances throughout . . *.plus* a consistent micro finish. You get perfect meshing and full capacity from every gear. Many leading manufacturers — Sikorsky, Stanley, Universal Winding, for example — rely on Perkins for top-quality gears, gears that cost less in the long run. Ask us to quote on your next gear requirement. Then judge for yourself.

YOURS ON REQUEST Folder illustrating gears Perkins has made — face gears, generated and curvic clutches; bevel, spiral, helical and spur gears; ratchets, sprockets and ground thread worms — from all materials. Includes Perkins facilities for producing various gear types and sizes. *Write today.*

PERKINS
MACHINE AND GEAR CO.

Dept. 21, West Springfield, Mass.
Telephone: REpublic 7-4751

tions can be forgotten sometimes.

Point Fits Job—The fixture lets grinders turn out points for different jobs, with varying configurations and clearance angles. Points break down into three basic categories for: (1) general purpose drilling, (2) aluminum and nonferrous metals, (3) steel and iron.

Above are some types, clearance angles the tool can produce.

Using the proper point is said to eliminate "grabbing" when drilling sheet metal and soft materials.

Adjusting a single clearance cam on the fixture can produce desired points, including extremely long ones or points beyond 180°. Infinitely adjustable, this cam is used for either right or left hand drills. It handles drills with 2 to 24 flutes.

An inexperienced operator can learn how to grind the points in about an hour, the company says.

Want More Data?

You may secure additional information an ony item briefed in this section by using the reply card on page 131. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Controls

Unit reduces foil waste of high-speed slitter

A yearly saving of $30,000 through reduction of tantalum slitting waste is reported by a leading capacitor manufacturer since installing an edge control unit on its foil slitter.

A product of Intercontinental Dynamics Corp., Englewood, N. J., the unit provides lateral foil slitter control accurate to 0.005 in. It can apply to control of many kinds of materials and metals, handled at high speeds with extreme accuracy.

The unit consists of three major elements: (1) A sensing head, the detection device, monitors the web edge and signals to the system any changes in its lateral motion; (2) A control box, which receives the signal from the detection system, relays it to the correction device. (3) The correction device actuates a mechanism to return the web to its correct position.

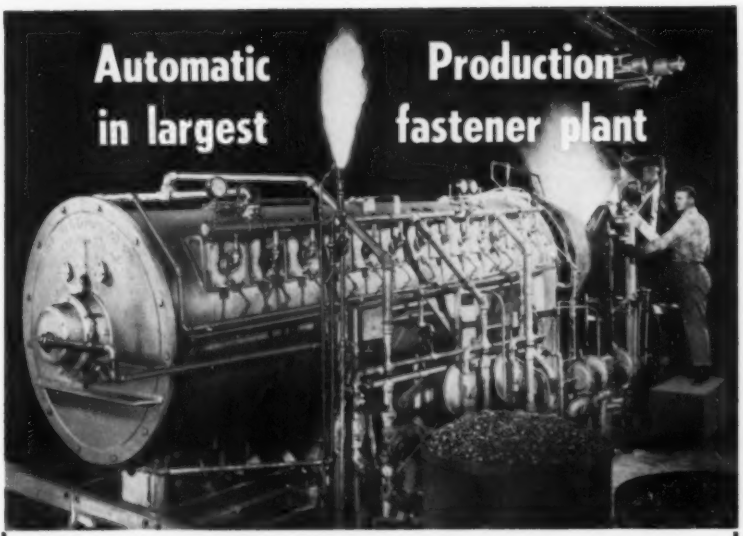
Handling

Plant uses same siding for trucks, trains

Thanks to a variable-height loading dock, a large shipper and receiver of metal products uses the same loading dock for railroad boxcars and motor trucks.

Since the area between the present dock and wall is just wide enough to accommodate railroad cars, it's impossible to back trucks up to it. But this doesn't stop materials handlers at American Brass Co., Buffalo, N. Y.

First Attempts Fail—At first, they tried a platform with one end hinged to form a ramp. This didn't work. The hinged ramp compensated for the difference in height of the truck floor as it was loaded and unloaded; however, it didn't accommodate fork lift trucks. These couldn't run on the ramp



IT'S THE MODERN . . . . . EASY WAY TO HEAT TREAT BOLTS, NUTS and other FASTENERS

The above is only one of several AGF Automatic FURNACES of the same type used by Russell, Burdsall & Ward plant in Port Chester, N. Y.

Bolts, nuts, rivets, screws, pins, clips, screw machine parts of all kinds . . . and the wide area of stamped, forged and coined parts, products, accessories and components . . . all are most economically heat treated in AGF Rotary Retort Furnaces.

Small parts manufacturers have found that AGF Automatic Furnaces, substantially cut hardening costs whether their production need is under 150 pounds or over 800 pounds per hour. The clean and uniform results are due to rotary action of the retort which mixes the work, eliminating all possibility of overlap or "hot spots" . . . an exclusive AGF feature.

The entire system can be engineered by AGF Metallurgists and Engineers at a minimum cost to you. Talk it over with the direct factory representative in your area. There's no obligation and no requirement is too large or too small.

AMERICAN GAS FURNACE CO.
1004 LAFAYETTE STREET — ELIZABETH 4, N. J.
"Pioneers since 1878"

Wide *or* Narrow...

1 C-F LIFTER HANDLES THEM ALL

Whether your production requires a few or many widths of sheet steel, 1 C-F Lifter, with its wide range of jaw and carrying angle adjustments will probably meet all your sheet handling requirements.

Adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes almost instantly.

Because it can pick up, carry and unload more loads per hour, using less man and crane time than any other method, a C-F Lifter will soon pay for itself.

Bulletin SL-25 gives you the complete story of C-F Lifter advantages to you. Ask for it today. There's no obligation.

CULLEN-FRIESTEDT CO.

1303 South Kilbourn Avenue • Chicago 23, Illinois

AMERICAN SHEAR KNIFE CO.

HOMESTEAD, PENNSYLVANIA

TECHNICAL BRIEFS

without bending forks or spilling loads.

Not discouraged, they kept trying. Engineers from Hamilton Tool Co., Hamilton, Ohio, suggested installation of a Portelevator. This is a platform that raises or lowers to attain a constant level with the truck floor. The deck size, exclusive

This platform allows loading of trucks and trains in same area.

of extensions that make a bridge to the motor truck, is 10 x 12 ft. The platform has a 10-ton capacity. 22½-in. vertical adjustment.

Worm Drives It—Vertical travel is via a worm drive to a screw on each of the platform's four corners. A stop-start-inch button controls it.

To clear the track for freight cars, an overhead crane lifts it out of the way. Special feet on the platform fit the rails exactly, simplifying repositioning and giving a steady base.

Stamping

Press feed keeps close accuracy at 2500 ipm

A new press feed arrangement hitch-feeds material at 2200 to 2500 ipm with accuracy to ±.002 in. This permits high speed stamping of parts with long as well as short feed increments, from coil stock.

According to its developer, Precision Welder & Flexopress Corp., Cincinnati, feed strokes up to 36 in. are entirely feasible by the method.

The new mechanism is extremely adaptable and flexible in application. It's not special purpose equipment. It works in conjunction with a standard high speed press, which uses conventional, readily accessible dies.

Metal Powder

Rolling mill compacts nickel powder into strong strip

Excellent mechanical properties result from roll compacting nickel powder into strip. So states a recent report by Dr. J. A. Lund of the University of British Columbia.

Based on work done for Sherritt Gordon Mines, Ltd., Fort Saskatchewan, Alberta, the report tells how a Stanat horizontal metal mill using 6-in. diam x 6-in. face rolls produces green strip density varying from 77 to 88 pct of the theoretical density of pure nickel.

Sinters At 2250°F—After initial roll compact, the material passes through a sintering furnace. This sinters the strip at 1900 to 2250°F for corresponding times of 30 to 50 minutes.

Sintered material is then processed on a Stanat 2-high/4-high combination rolling mill with ¾-in. diam work rolls and 4-in. diam x 6-in. face width backup rolls. This achieves a total cold reduction of 65 to 75 pct in thickness of the sintered strip. Intermediate and final annealing at 1600°F takes place for 30 minutes.

The report says densified and annealed strip has been reduced by this method up to 45 pct in thickness by cold rolling without annealing. Tensile strength of the strip rose to 95,000 psi with this treatment.

Stanat Mfg. Co., Inc., Westbury, N. Y., makes the rolling equipment.

Fabrication

Fabrication of heavy-gage sheet metal elbows with no transverse seams is being performed by Con-

Useful Technical Data File...

on FAMOUS ALLIED PRODUCTS

For Finishing, Cleaning and Protection of Metals

Here's a wealth of technical information gathered as a result of extensive product research, development and use throughout the world. This comprehensive file explains and describes all products, gives applicable metals, appearance of film, purpose of products, typical applications, U. S. Government specifications, method of application and test results.

IRIDITE® The finishing industry's most complete line of chromate conversion coatings. Give peak corrosion resistance, a lasting paint base and widest choice of appearance in decorative finishing on

ZINC AND CADMIUM ALUMINUM CUPROUS ALLOYS MAGNESIUM SILVER

ARP® BRIGHTENERS Liquid and powder materials for barrel, still or automatic ZINC and CADMIUM plating. High chemical stability provides maximum quality at minimum cost. Liquids available in AUTO-FLO-PAK for economical automatic dispensing.

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WETTING AGENTS DETERGENTS DYES FOR IRIDITE FILMS

ARP® CLEANERS and DEOXIDIZERS Specially formulated to provide maximum performance with IRIDITE coatings on aluminum and zinc die castings.

IRILAC™ New method of protection incorporating corrosion inhibitors in a water-soluble polymer base which dries to an extremely thin, tough, durable coating —clear in color. Does not chemically affect base metal or any post treatments. Used as a protective treatment alone or to enhance value of post treatments.

Write now for your copy of Allied's Technical Data File, or call your Allied Field Engineer for full information on Allied products. He's listed in your phone book under "Plating Supplies".

Your Finishing Problems Invited

Our Research and Development Department will be happy to work with you to develop a finish for your needs.

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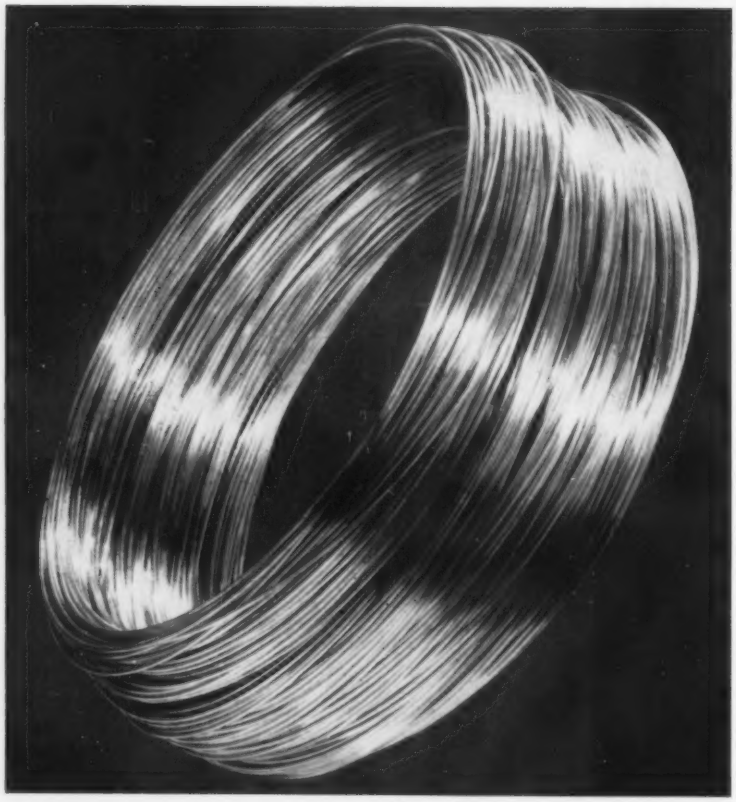
Manufacturers of IRIDITE®, IRILAC™, ARP® Brighteners and Plating Chemicals—West Coast Licensee: L. H. Butcher Co.



from CONTINENTAL
a lustrous new

TINNED WIRE

Here's smoothness and luster you rarely get in tinned wire. Continental's special technique makes possible an enduring, uniformly bright finish . . . a wire so bright that it can replace plated wire on many products. It retains its brightness for long periods of time in normal use. Continental tinned wire meets your needs for quality and workability and is available in almost any temper and analysis in medium low carbon and low carbon steels.

FINE—16 gauge through 30 gauge, in 8" diameter coils
COARSE—20 gauge through 5/16", in 16" and 22" diameter coils.

For smooth beauty and high degree of perfection in wire, you will want to investigate Continental Tinned Wire. Write or Telephone—today; or return coupon below.

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COMPANY_____
ADDRESS_____
CITY_____ STATE_____
☐ Send Complete Details ☐ Have Salesman Call

CONTINENTAL STEEL
CORPORATION • KOKOMO, INDIANA

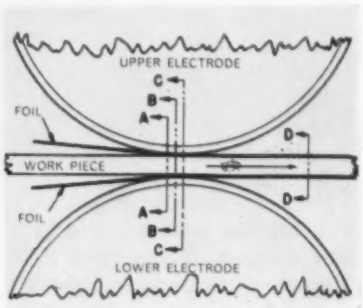
PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame Sealed, Coppered, Tinned, Annealed, Liquor-Finished, Bright and special shaped wire. Also Welded Wire Reinforcing and Galvanized Fabric, Nails, Continental Chain Link Fence, and other products.

TECHNICAL BRIEFS

solidated Ventilating & Duct Co., Jackson Heights, N. Y. These smooth elbows are stamped in two halves and both spot and arc welded together. Used in air conditioning, dust collection and similar systems, the elbows don't hamper distribution of air inside them.

Welding

Using a new welding technique, a new unit butt seam welds with foil. It makes smooth, non-overlapping seam welds of dense structure and high strength, at high speeds. Welds



Welder puts thin foil strips on both sides of butt seam.

have been made on 0.078-in. stock at 3 to 24 fpm.

Because it requires less heat and pressure than mash welding, the unit uses less power. Another feature: very little warping of sheets. It welds mild steel, low alloy, high carbon and stainless steel.

Precision Welder & Flexopress Corp., Cincinnati, makes the new foil welder.

Construction

Prefabricated steel stairs are proving a boon to workmen on large buildings under construction. Made by Potomac Iron Works, Inc., Hyattsville, Md., the stairs can be installed ahead of construction. This permits workmen to move easily and safety from floor to floor. It saves time and eliminates the hazards of using ladders. The builder is installing 92 flights of

stairs in 6 and 15-story state office buildings in Baltimore.

The all-welded prefabricated stairs utilize Jones & Laughlin Steel Corp. 10-in. 8.4 lb per ft channels as stringers, and 12-gage hot rolled sheets as risers.

Repair

Specialists straighten 12-ton steel mill motor shaft

Straightening of a 12-ton armature shaft from a blooming mill reversing motor has been completed by an electric apparatus service shop in one of the largest repair jobs it has ever undertaken.

The 18½-ft long shaft had been bent in an accident at a customer's steel plant. The 4000-hp dc motor and its two dc generators (combined weight: 142 tons) were shipped to General Electric Co.'s shop in Chicago from the East on three flatcars.

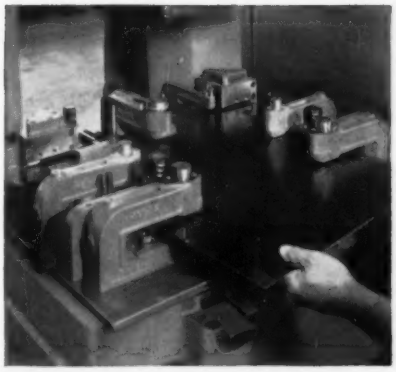
Reduces "High Spot"—Shop specialists, employing a series of heat applications, reduced a 0.070-in. "high spot" on the shaft's 23-in.

Intense heat from torches help straighten this large shaft.

diam drive end journal. Reduction was to 0.002 in.

Removal of the shaft from the armature was done by cooling the shaft while the entire armature was heated, with a high heat concentration on the armature spider. The shaft was replaced in the same manner.

Strippit Punching and Notching Units are easily mounted to templates, T-slotted plates or rails in unlimited patterns for long press runs or quick-change pilot runs. Complete range of standard tools, or "specials" made up on request.



the **bench man** does the tooling!

STRIPPIT multiple punching and notching

THE ABOVE CUTAWAY of a Strippit Punching Unit — one of a wide selection for flats, structurals and extrusions up to ¾" mild steel — illustrates the extreme flexibility, high production and economy of the Strippit system.

NOTE THAT each unit is complete with punch, die button, stripping guide, guide button, lifter assembly and retainers — all quickly interchangeable in a husky holder and actuated by the press ram. Multiple punching — and notching — press setups are easily bench-assembled on drilled mounting templates, with each unit accurately located by the pilot pin in its base. Press down-time is almost negligible in setups of Strippit Punching Units, Notching Units, Punch and Die Assemblies or combinations of all three.

Write today for full details and if you wish, a demonstration on your work at your plant by a Strippit mobile unit.

Warehouse stocks in Chicago and Los Angeles.

A UNIT OF HOUDAILLE INDUSTRIES, INC.

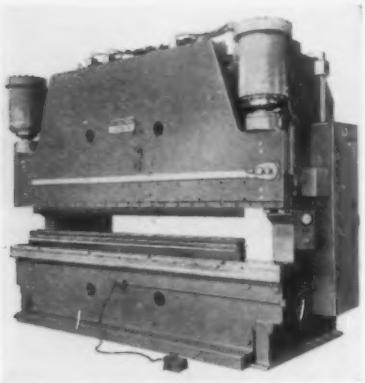
WALES STRIPPIT COMPANY

202 Buell Road, Akron, New York

Manufactured in Canada by Strippit Tool and Machine Limited, Brampton, Ontario

New Production Ideas

Equipment, Methods and Services



Hydraulic Press Brakes Cannot Overload

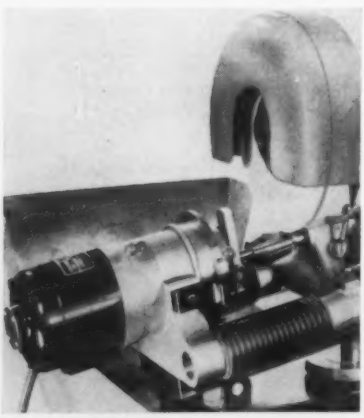
Hydraulically operated, new press brakes are available in various capacities up to 2000 tons. These units are for bending mild steel, from 10 gage to 2 in. and in lengths to 30 ft. Because of their hydraulic design, the press brakes cannot overload. Regardless of size plate put into a press, it cannot be damaged; only the ram will stop, and it can be backed away immediately. Power is constant during the entire stroke. This varies from 12 in. for the smallest brake (rated at 200 tons), to 18 in. for the larger machines. Special longer stroke machines can also be furnished. The ram may be started, stopped and reversed at any point in the stroke. It need not continue through a complete cycle. This permits inching the ram to the work. (Cleveland Crane & Engineering Co.)

For more data circle No. 40 on postcard p. 131

Electronic Control Makes Weld Lines Flexible

New non-synchronous electronic combination welder controllers fit high-speed production welding lines. They give flexibility to these lines for meeting materials and design changes. Increased versatility and simplified maintenance are effected by functional breakdown of the control into individual panels for sequence timing, power supply, valve operation and contactor firing. The combination control with 600 frame contactor provides for either 200 or 400 amp QMB fusible disconnect switch, and either a 3B or 5B timer. Tube or relay control of the air valve is possible. Tube or relay firing of the ignition contactor is also a matter of choice. The welder controllers provide for the plug-in addition of heat control, slope control, current regulator, forge delay, dual control functions and other special features. (Square D Company).

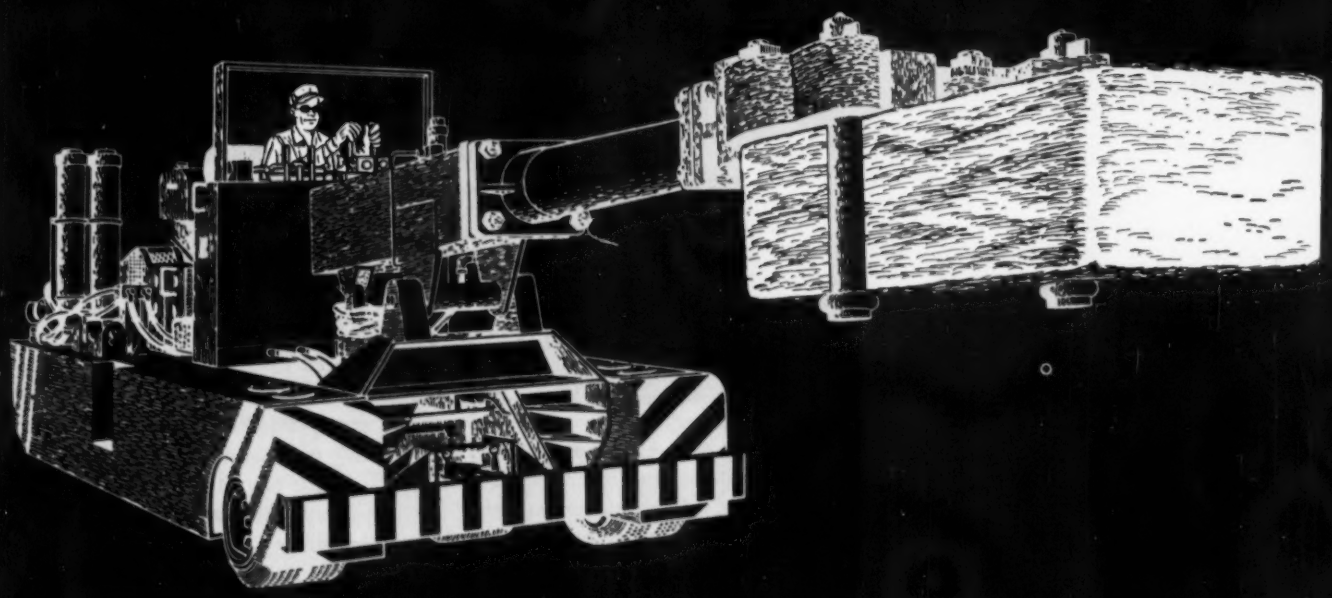
For more data circle No. 41 on postcard p. 131



Grinding Attachment Doubles as Inspector

This highly accurate cylindrical outside-diameter dual purpose grinding attachment uses true dead centers which assure a concentricity to 0.0001 in. total indicator reading. It also serves as an inspection instrument, when needed. When serving grinding operations, the attachment sets directly on either the magnetic chuck or table of the surface grinder. When serving as an inspection fixture, it sets on the surface plate. The unit has a built-in sine plate and micrometer. These permit grinding and inspection of tapers within seconds of an arc. Spring loaded tailstock centers contribute to the attachment's accuracy. The unit has a micrometer range of ± 0.025 which eliminates need for a set of gage blocks. An index plate permits indexing of work within seconds of an arc; it has 24 divisions. (Gebhart Machine Tools, Ltd.)

For more data circle No. 42 on postcard p. 131



You save time, space and money with this Salem-Brosius furnace charging machine

For maximum efficiency and flexibility in furnace operations, load and unload your heating furnaces and charge your melting furnaces with a Salem-Brosius Auto-Floor Charging Machine. One man at the controls operates this agile piece of equipment, serving furnaces faster and with greater all-around economy than is possible with any other stock-handling equipment.

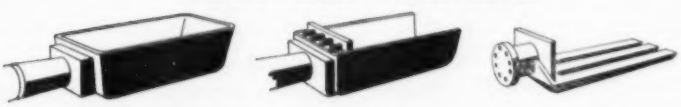
Floor travel is rapid and unencumbered, and stock handling is swift, positive and effortless. It reduces manpower by mechanizing furnace charging.

Self-powered, the machine is built in seven sizes, ranging in load carrying capacities from 2000 to 20,000 lb., and operates at floor speeds up to 250 ft. per min., doing the complete stock-handling job without auxiliary materials handling equipment. It requires no floor installations that become permanent obstructions; nor does it become an obstruction when not in use, because it can be parked out of the way. The Salem-Brosius Charging Machine is highly maneuverable, being able to turn on its own wheelbase to reach furnaces and stock piles anywhere in the plant.

Initial cost of the Salem-Brosius Charging Machine is far less than other types of charging equipment. It has saved as much as 75% in operational costs, replacing several men of a furnace crew. It eliminates costly maintenance of elaborate materials handling equipment, while requiring a minimum of maintenance itself.

Before you invest in expensive stock-handling equipment, investigate the Salem-Brosius Auto-Floor Charging Machine—designed and built by men who know your stock-handling problems.

MELTING FURNACE WORK HEADS



Rotating Box | Pusher Box | Pusher Fork

HEATING FURNACE WORK HEADS

Tongs | Sliding Jaw

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited • 1525 Bloor Street West, Toronto 9, Ontario

SPECIAL MECHANICAL EQUIPMENT • INDUSTRIAL HEATING FURNACES • MATERIALS HANDLING EQUIPMENT

Welding Positioner "Thinks" for the Operator

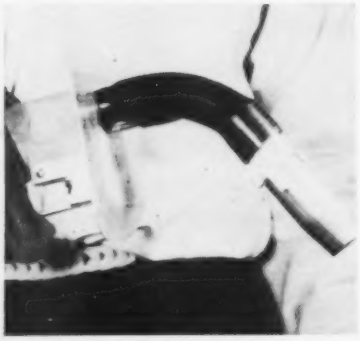
An "almost human" 3000-lb capacity welding positioner "thinks" for its operator. To speed up joining and selection of the fastest possible method of arc welding, the unit automatically produces the required welding condition for each specific job. It automatically arc welds various cylinders at any speed required by the welding procedure. Rotation drive and controls designed into this positioner let the operator quickly set rotative welding speed in ipm to the desired value. Table speed, workpiece diameter and welding speed are the three variables which this control system automatically correlates. Two calibrated dials appear on the push button station. One dial reads work diameter in inches; the other, welding speed in ipm. To set the proper table rotation speed, the operator simply turns one pointer to correspond with the workpiece diameter and the other to the desired welding speed. The table then rotates the proper rpm. (Pandjiris Weldment Co.)

For more data circle No. 43 on postcard p. 131

Spectacles Combine Appearance, Safety Features

Frames on new spectacles for personnel working in areas of potential danger to their eyes boast special safety features. These new onyx on crystal safety glasses employ an eye-wire with a specially developed groove. This not only holds lenses securely but also supports the lens when it is struck by an outside object; it keeps the lens from being driven backward toward the eye. The frame's lens groove is deeper, accommodating true safety lenses. It's engineered to give maximum support of the entire periphery of the lens; if the lens should break under unusually severe impact, fragments are held together. The frame will not conduct electricity. Flame-resistant, strong and lightweight, the frames come with five-barrel hinges and screws made of corrosion-resistant metal. Three eye sizes are available. Bridge and frame sizes are clearly marked on each unit to aid fitting and save time. (American Optical Co.)

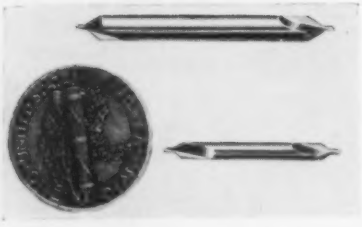
For more data circle No. 44 on postcard p. 131



Welding Gun Uses CO_2 As an Arc Shield

Using the metal-inert-gas shielded arc welding method with carbon dioxide as an arc shield is a new air-cooled gun. Light weight, easy to use, and economical, it eliminates need for water hoses and connections. The semi-automatic welding gun, in one application, joins mild steel auto frame subassemblies at production speeds greater than 200 ipm. Ease of operation and manipulation results from elimination of water hoses. Gun, control, and wire-feed unit are portable, or can be separated into components for strategic mounting for single station operation. (Hobart Bros.)

For more data circle No. 45 on postcard p. 131



Small Center Drills Come in No. "0" and "00"

Two small-size center drills (with countersinks) come in sizes "0" and "00". The No. 0 center drill has a drill diameter of 1/32 in., a drill length of 1/16 in., a body diameter of ⅛ in., and measures 1¼-in. long. The No. 00 has a drill diameter of 0.025 in., a drill length of 3/64 in., a body diameter of 5/64 in., and is ⅞-in. long. (Woodruff & Stokes Co., Inc.)

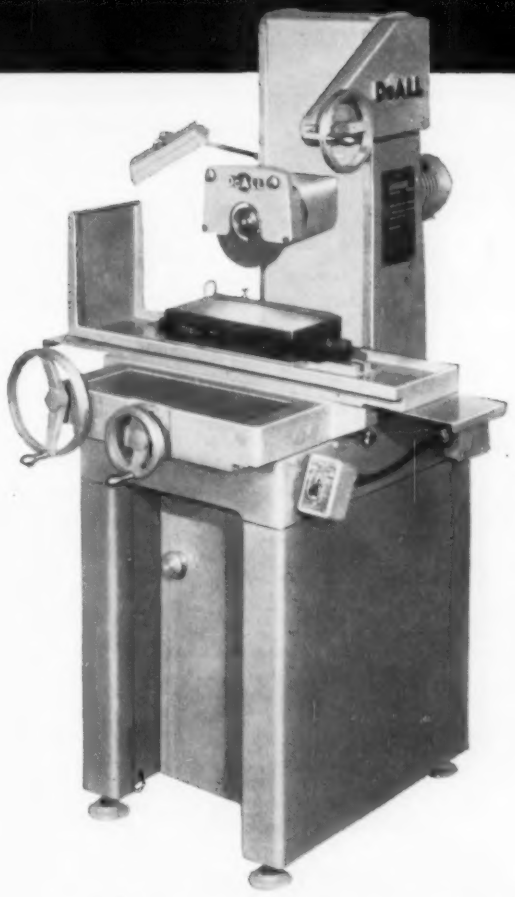
For more data circle No. 46 on postcard p. 131

Joining the Family of Fine DoALL Precision Surface Grinders

MODEL DH-612

DoALL *Announces . . .*

a *NEW* Super Precision Hand-Operated SURFACE GRINDER



Tailored to Fit the Operator for Easier, More Productive Work

- **NEW-DESIGN VERTICAL FEED HANDWHEEL** in easy-to-reach, safe position
- **ADJUSTABLE MACHINE OPERATING HEIGHT**
- **SMOOTH TABLE ACTION**—manual traverse through timing belt drive (hydraulic drive optional)
- **RIGHT- or LEFT-HAND TABLE DRIVE**—handwheel position instantly interchangeable
- **VERTICAL HANDWHEEL** graduated in tenths (Zero Slip Rings optional)
- **SADDLE LOCK** for form and plunge grinding
- **1 H.P. MOTORIZED SUPER PRECISION SPINDLE** with anti-friction bearings
- **KNEE-RECESSED** cabinet base

"Human Engineering" guided DoALL engineers in the design of this new surface grinder. Low in cost yet superior in accuracy, it is manufactured to set completely new performance standards in a hand-operated surface grinder.

Every design feature and control function was carefully considered for the operator's convenience. Now the most exacting work may be turned out with least operator fatigue. With tolerances closer than ever before, this assures users of the Model DH-612 a definite competitive advantage.

Standard machine includes not only the exclusive features above, but also telescoping dust guards and one-shot lubrication system to table, saddle, column ways, elevating screw, gears and bearings. A full range of optional accessories is available including "Cool Grinding" through-the-wheel mist coolant system. Table travel is 7″ x 13″; work height, 0 to 12¾″; vertical feed to .0001″ and crossfeed with vernier to .0002″.

In ease of operation, accuracy, power and completeness, there is no finer grinder. Full details are at your DoALL Store—or write . . .

THIS IS A TYPICAL DoALL STORE

THE DoALL COMPANY, Des Plaines, Illinois GR-26

MACHINE TOOLS . . . . . CUTTING TOOLS . . . . . MEASURING INSTRUMENTS . . . . . SHOP SUPPLIES IN STOCK

NEW EQUIPMENT

Fume Scrubber

Specially designed, a new scrubber captures and removes highly corrosive fumes given off by titanium pickling baths. The baths contain 40 pct nitric acid, and a smaller percentage of hydrofluoric acid. The scrubber is of packed tower type, constructed of steel lined with sheet Koroseal. For economy the scrubbing solution, flowing counter to the motion of the air being scrubbed, is recirculated. (Heil Process Equipment Corp.)

For more data circle No. 47 on postcard p. 131

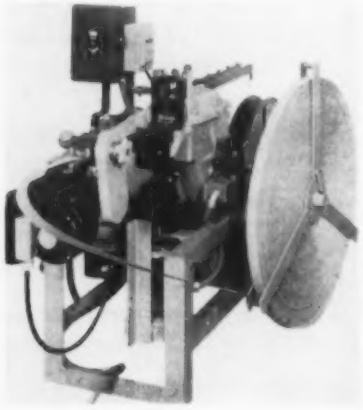
Cutoff Unit

Special machines are available for high-speed cutting of commercial welding rod and similar short items. Capacity of the machines in mild steel is 3/32 to ¼ in. diam. In high carbon, alloy and stainless it's 3/16 in. diam maximum. Feed speeds run from 75 to 520 fpm. A smooth, high-speed shear actuating mechanism is attained without loose links, cams or springs. This new cutoff unit, which travels with the rod and cuts while in motion, is suited for either long or short lengths. With an air clutch, perfect synchronization of the cutoff and wire speeds and maximum accuracy can be attained in the 125 to 395 fpm range. (Lewis Machine Co.)

For more data circle No. 48 on postcard p. 131

Strapper Attachment

An attachment for one maker's power strapping machines feeds a low cost chipboard paper underneath the strapping. Intended primarily for strapping small bundles of millwork, it may also be useful on other small packages with finished surfaces that require protection. In strapping metal products with sharp corners, it increases effective strap tension around the bundle by decreasing friction at the corners. (Signode Steel Strapping Co.)



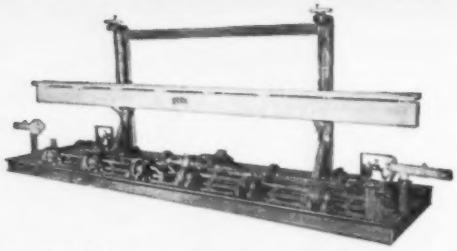
For more data circle No. 49 on postcard p. 131

Straightener

This two-roll straightening machine has an open side gear box housing. According to its builder, the open housing simplifies handling of short lengths of bars or tubes. It also facilitates rapid discharge of the workpiece from the machine.

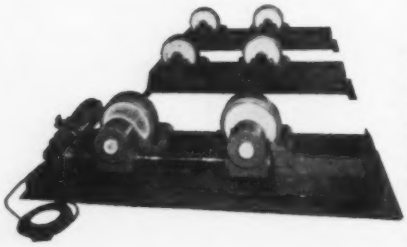
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages

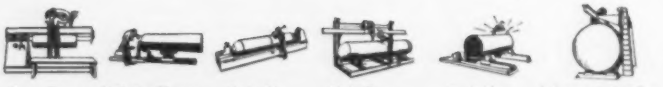


Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.



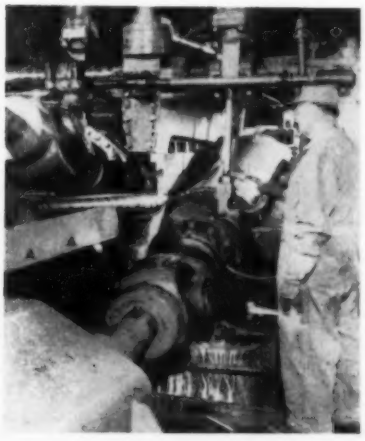
Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

FOR ILLUSTRATED LITERATURE WRITE DEPT. E

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

THIS IS A
TYPICAL DoALL STORE
MACHINE TOOLS ..... CUTTING TOOLS ..... MEASURING INSTRUMENTS ..... SHOP SUPPLIES IN STOCK

And it makes it easy to check size of the workpiece when the straightener is used for precision cold sizing. The straightener handles tubular products and solid steel bar



stock in rounds up to 10 in. diam. In operation at The Timken Roller Bearing Co., Canton, Ohio, this particular machine straightens heavy wall tubing used in bearing races. (Blaw-Knox Co.)

For more data circle No. 50 on postcard p. 131

Muffle Furnace

For operation from 1150 to 2100°F, new hydrogen atmosphere muffle furnaces handle bright brazing, annealing and hardening of stainless steel parts. Extended operating range of the furnaces also permits use for silver soldering and annealing of ferrous, non-ferrous or precious metals. Work is placed in alloy baskets and pushed through purging, heating and water-jacketed cooling sections of the furnace. (American Gas Furnace Co.)

For more data circle No. 51 on postcard p. 131

Decontamination Unit

All emergency safety facilities operate instantaneously when a contaminated victim jumps into a new decontamination booth. Of one-piece fiberglass, the shower stall has the following emergency safety facilities: (1) A drench shower unit sends a sudden torrent of water down on the victim and washes away acids or other injurious materials; (2) Eight body spray nozzles do a complete drenching job on every part of the body; (3) An eye and face wash fountain allows the victim to cleanse both eyes and his complete face with clean water at controlled pressures. (Haws Drinking Fountain Co.)

For more data circle No. 52 on postcard p. 131

Layout Tool

This laying-out tool permits the making of layouts from five sides, plus inside surface checks with only one setting of the casting. The workpiece or casting does not have to be clamped. Time sometimes wasted in re-positioning angle plates, protractors and other hand tools is eliminated. The machine lays out and scribes vertical and horizontal lines on workpieces up to 48 in. vertically and 36 in. horizontally. Measuring unit of the machine permits scribing inside or outside lines for hole center location.

STANDARD EQUIPMENT
Air clutch and brake. IIC controls plus dual air valve. Four square type gibs with bronze surfaced ways on ram. Hard bronze crankshaft bushings and ball seat. Ram counterbalances. Forced lubrication, etc.

- 150 ton capacity adaptable for a wide range of jobs.
- Plain flywheel or back geared type.
- 6½" dia. main bearings, 9" dia. crank pin.
- Dimensions of bed and ram face, stroke length and shut height available as required.
- Extra heavy box type steel weldment tie rod construction.
- Rigid and accurate for precision work and long die life.

Write — Bulletin L-18 on 20 to 150 ton single and double crank straight side presses . . . also, 30 to 75 ton double crank gap frame presses.

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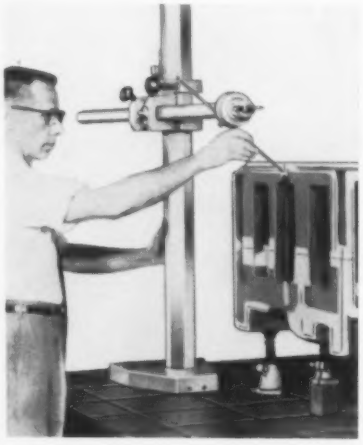
NEW EQUIPMENT

finish allowance and casting clean up. Vertical and horizontal scales are marked off in inches with separate adjustable verniers reading to



1/64 in. Vertical scriber rotates 360° and swings horizontally 180°. (Portage Double-Quick, Inc.)

For more data circle No. 53 on postcard, p. 131

Nameplates

Polyester film self-bonding nameplates can now be made to customer specifications as dials, rating plates, instruction plates or decorative trim. Nameplates are subsurface printed, metalized and sealed to assure permanent legibility of legend, trade mark, pattern design or decorative trim. (W. H. Brady Co.)

For more data circle No. 54 on postcard, p. 131

Block Breaker

A heavy-duty machine just built breaks railroad car wheels, heavy machine castings, and motor blocks. It makes it easier for scrap yards and steel mills to separate nonferrous metals. (Chattanooga Welding & Machine Co.)

For more data circle No. 55 on postcard, p. 131

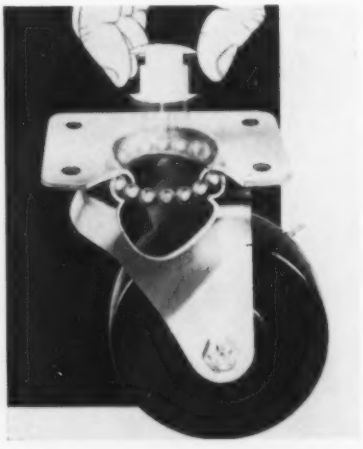
Ladle Feeder

For making ferro-manganese or other alloy additions to the ladle while steel is being tapped, a new automatic feeder is an improved version of a model introduced in 1955. In its simplest form, the feeder consists of a suitable hopper, an electrical vibrating feeder, an adjustable chute and a control panel. Manganese or other alloy additions feed at a controlled rate through the adjustable chute to the proper place in the ladle. Users of the older model report greater efficiencies from some ferro-alloys when additions are made to the ladle rather than the furnace bath. Basic change in the newly designed feeder is this: It incorporates one or more hoppers, with each bin having a separate vibratory feeder. Each bin mounts on strain-gage type load cells. With this equipment, it isn't necessary to weigh alloys going into the hoppers. Through a control panel, an operator can precisely control additions. (Blaw-Knox Co.)

For more data circle No. 56 on postcard, p. 131

Kingpinless Caster

The conventional king-pin, usually the first thing to fail on a caster, simply doesn't exist in a new caster. Its replacement is a unique single ball raceway that performs multiple functions. The new raceway first



joins the top plate to the yoke, (formerly the king-pin's function); secondly it acts as the load thrust bearing. The new "king-pinless" bearing is said to achieve a marked increase in caster life expectancy and easier swiveling under industrial load conditions. (Rapids-Standard Co., Inc.)

For more data circle No. 57 on postcard, p. 131

Harness Clamp

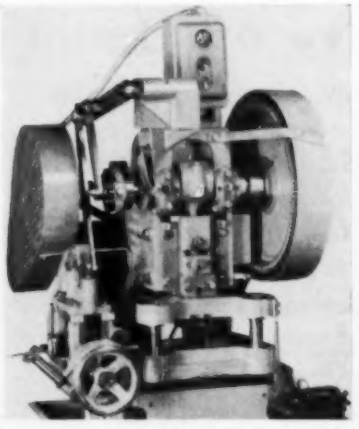
Quick-operating harness clamps recently developed can be permanently mounted by means of a rivet or a bolt and opened or closed in a quarter turn. Designed for holding wire bundles, hose, cables, conduit and similar equipment, the

harness clamps come in four sizes: ⅜, ½, ⅝ and ¾ in. Made of corrosion-resistant stainless material, they have rounded edges to guard against cutting or scratching. (Camloc Fastener Corp.)

For more data circle No. 58 on postcard, p. 131

Metal-tag Marker

A press produces "wrap-around" tags from coil stock of aluminum or other soft metals and alloys. The machine marks, punches a hole, and cuts off tags of any length up to 7 in.



Using ¾ in. wide coil stock, the machine features a back-geared, mechanical press, equipped with an air-operated clutch and a predetermining counter which can be set up to run off any quantity of tags. (Noble & Westbrook Mfg. Co.)

For more data circle No. 59 on postcard, p. 131

"Hummm . . . aluminum killed steel . . .
pocked to death by inclusions.
Sad case. Could have been helped.
A little ELECTROMANGANESE
. . . no carbon . . . no silicon."

. . . and it costs less in the long-run!

ELECTROMANGANESE® Foote's electrolytic manganese is guaranteed 99 95/100% pure. Available in 250- and 500-pound steel drums, and in 2000-pound pallet boxes. Can also be purchased in a special Hydrogen-Removed Grade (H/7.5 ppm) and special Nitrided Grades (Nitrelmang®). Write for Technical Data Bulletin 201 and price list. Address request to Technical Literature Section, 438 Eighteen West Chelten Building, Philadelphia 44, Pa.

FOOTE MINERAL COMPANY

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Designed for the golfer who likes to goof . . . off. But before you produce the "Golf-Master", you had better find out about cold rolled steel from your A.W. Representative. He is the man to see in every case! Your A.W. Representative may order a metallurgical study of your problems and bring about savings that build new profits and greater potential. He can provide you with the latest information on cold rolled steel and its application, plus experienced advice on the gauge, size and type to order. Call him today. Your A.W. Representative is always available . . . never out of touch with your location.

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Steel cabinets, lockers & shelving

The Iron Age Summary

June Rush Bigger Than Expected

Both mills and their customers have been caught off guard by strength of June orders.

Tightening market has resulted in behind-the-scenes jockeying for delivery position.

▪ The June steel rush has been much bigger than expected. Both the mills and their customers have been caught off balance.

The mills were counting on a June spurt by consumers as a hedge against the expected price boost in July. But the volume of orders specifying June delivery has grown to unlooked-for proportions. As a result, some June business will carry over into July.

Jockeying for Position — June's upsurge apparently has been caused by a combination of price hedging and actual need due to low consumer inventories. Among those caught short are several of the auto companies. A lot of behind-the-scenes jockeying for preferred position on steel order books is now going on. Some users have even tried to by-pass steel sales departments by going directly to mill production contacts.

Mills that had expected a sharp July downturn are quietly revising their estimates. At one mill, plants that had been slated for July vacation shutdowns will continue to operate. Another firm is sticking to an earlier forecast that the July letdown will be cushioned by carryovers from June.

Risky Business—For many users the current market tightening points up the risk of allowing steel stocks to drop to the danger point. Steel capacity is more than ample to take care of customer needs over the long haul, but short-term pinches are bound to occur in a period of low inventories.

The mills themselves are up against it. It's no easy job to get neglected furnaces back onto the production lines, As a result, they're actually losing some business due to inability to meet delivery demands of customers.

Price Speculation — Meanwhile, the leading steelmaker is expected to reach a decision next week on how much prices will rise as an offset to higher employment costs to take effect July 1. Apparently mill officials are holding off until the last minute.

Some rumors have been circulating that there might be a delay in the increase. But these reports are not given much credence by steel people. It's pointed out that if prices are going up—and no one is denying that they will—they will have to move at the same time wage costs rise.

What About Extras?—Since the expected base price boost would be the second in a row, some observers are speculating on the question of whether so-called steel extra charges also will rise this time. It's pointed out that two base price rises might tend to throw extra charges out of line.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,741	1,728	1,523	2,189
Ingot Index				
(1947-1949=100)	108.4	107.6	94.8	136.2
Operating Rates				
Chicago	72.0	71.0*	58.0	84.5
Pittsburgh	60.5	58.5*	52.0	86.0
Philadelphia	71.0	66.0*	61.0	100.0
Valley	48.0	49.0*	40.0	73.0
West	79.0	80.0*	74.0	106.0
Cleveland	48.0	45.6*	30.0	87.0
Buffalo	54.0	54.0	46.0	102.0
Detroit	67.0	62.0*	46.0	103.0
South	66.0	60.5	67.0	93.0
South Ohio River	63.0	60.0*	61.0	84.0
Upper Ohio River	71.5	78.0*	75.0	84.0
St. Louis	85.0	89.0*	78.0	55.5
Northeast	35.5	35.5	31.0	66.5
Aggregate	64.5	64.0	56.4	85.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	$66.49	$66.49	$66.49	$64.56
Scrap, No. 1 hvy (Gross Ton)	$35.17	$35.50	$34.00	$56.17
No. 2 bundles	$25.83	$26.50	$25.50	$47.50
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	26.50	25.00	25.00	32.00
Lead, St. Louis	10.80	10.80	11.30	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	94.50	95.125	94.25	98.125
Zinc, E. St. Louis	10.00	10.00	10.00	11.00

Coated Abrasives Trend Grows

With most expansion plans completed, abrasives makers are busy trying to keep new capacity operating.

Trend toward use of coated abrasive belt grinders is helping market stay alive.

▪ Abrasives makers continue to take their cue from metalworking. Always sensitive to the ups and downs of their largest group of customers, their sales slowed considerably during the winter. It adds up to a buyers' market.

Abrasive buyers can find ample stocks, with delivery for standard items in a matter of days. And special orders go through quickly. Prices are unchanged and increases are unlikely until the fourth quarter, if then.

Belts Popular — The industry's capacity is ample. Raw materials are plentiful with the exception of diamonds. Shortages of industrial diamonds that were reported during the past few months probably will continue for a year or so. But the tightness is by no means critical.

Overall sales of abrasives this year will undoubtedly be below those of recent years. The drop will be more noticeable in bonded wheels, since coated abrasive belts still show signs of growth.

Research Continues—More than 50 coated abrasive machine tool builders showed off their wares last week at the third bi-annual industry show at Troy, N. Y. Emphasis continues on higher grinding speeds and better finishes. One eye-catcher was a 150-hp belt grinder now being checked out as a mechanical descaler for steel mills.

The industry continues to carry on a long-range research and development program. Emphasis is on developing better abrasives and better ways of using existing materials. Buyers are well-advised to check back periodically with manufacturers to make sure they are taking advantage of latest developments.

Expansion Slows Down — The industry as a whole has just about finished a major round of plant expansion. There is still possibility of capacity increases by wheel and belt grinding machine makers, but otherwise little new construction is in sight. The industry is confident that it has an ample supply of abrasives for some time to come.

While no shortages are anticipated, users may want to review their abrasive inventories late in the third quarter to make sure they will have ample stocks in event of a sharp, last-period spurt. An ear to the ground for price increases late in the year may also save money. That's when the industry expects a real spurt in demand.

Metalworking Indicator—Abrasives sales can be a barometer of metalworking developments. If the present rumblings turn into a real pickup, it should herald an overall rise in metal working activity. In the past, abrasive sales have risen slightly ahead of other indicators, sloped off at about the same time.

The explanation is in the industry's highly diversified market. But it is particularly sensitive to fluctuations in its two largest markets—steel and automotive. Abrasives makers see little chance of real strength until these two giants flex more muscles.

BEST SELLER: Coated abrasive belt grinders are the fastest moving items in the abrasives market. Grinder above removes gates from sand-cast aluminum part for punch press. Photo: Behr-Manning Co.

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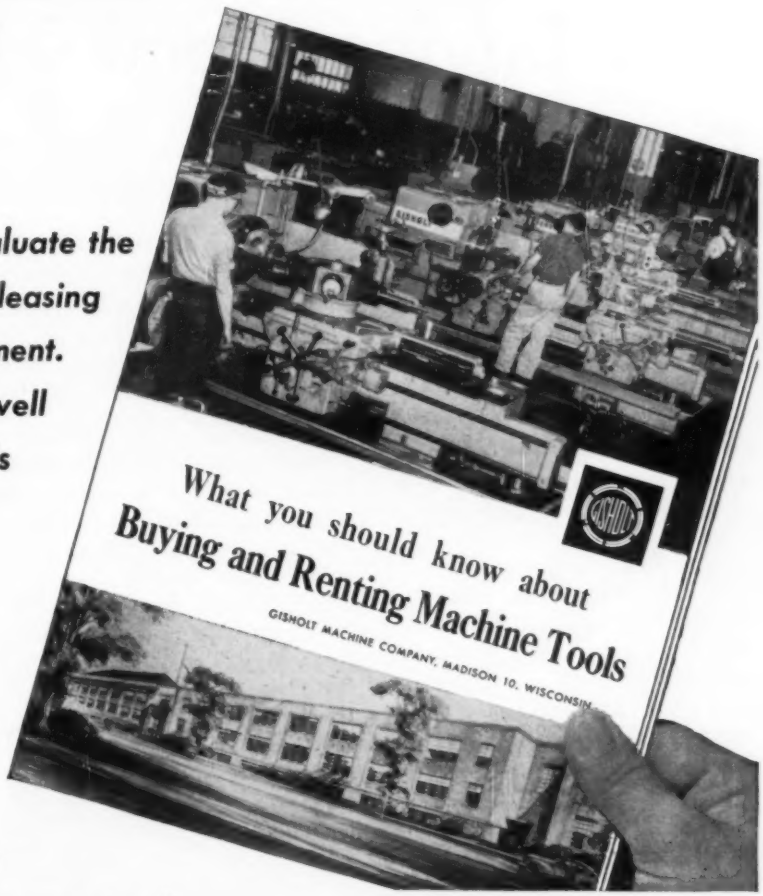

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STEEL PRODUCT MARKETS

Late Buying Trend Develops

If trend to late-month steel buying continues, it could embarrass mills and users.

Late buying surge in June found several mills over-booked on some products. These included plates, structurals, cold-rolled sheet and galvanized.

▪ It's possible that some of the late June rush ordering is not just hedge buying. Some steelmen think they detect a trend to more and more late ordering.

If this trend accelerates, it could put both mills and users in uncomfortable positions. This month, for example, the rush reached the point where several mills were over-booked for June delivery.

Depending on the mill and geographical location, carryovers will exist in some cases for cold-rolled sheet, plates, structurals, and galvanized. In some cases, heavy plates and structurals are being sold on a "maybe" basis for June.

Late ordering may account for some of the lag in July bookings, which are disappointingly low to date. Because of longer than usual vacations, and other seasonal factors, July is not expected to come up to June in any case. But present orders make the month look weaker than expected.

This puts mills in an uncomfortable position. They do expect some uptrend of orders in late July, but the rate now will not support operations at much over the March-April level. Mills are reluctant to schedule much anticipation melting.

With comparatively low operating rates scheduled for July, a rush of late orders could find more mills over-booked. A number of factors, such as the possibility of a real rush of automotive and auto supplier orders, could cause a jam for the late comers.

Plates and Structurals — Here's an indication of a stronger tone to the market: Buyers are not withdrawing orders that will miss the June 30 price deadline. A drop in ordering is still expected in July, but firmness of current business indicates that purchases are for immediate need as well as in anticipation of price changes.

Overall, June will be a better month than May for plates and structurals. Orders came in late, but with a rush when they started. Light structurals are still available for June delivery in most markets. But June deliveries for plate are still in the nip-and-tuck stage.

Sheet and Strip—Latecomers for flat-rolled products may also miss the June delivery boat. At least one **Pittsburgh** mill is over-booked for the month on sheets. In **Chicago**, at least three mills will have about a week's carryover on cold-rolled sheet into July. But July tonnage is coming in slowly. Generally, a slackoff in July seems inevitable in that some customers will admit to about a 20 pct price hedging factor in their June buying. One automotive plant in the Midwest indicates, however, that its July buying will be up 20 pct. What happens to the sheet market this summer largely depends on how early automotive users get into action on 1959 models.

Stainless — A slightly stronger tone to the stainless market is noted. Although it is mild, the improved buying is not in the nature of a flurry. It has led some stainless producers to believe the worst is over and that users are now ordering on the basis of what they need. But the July letdown is also expected to take a momentary toll here too.

Bars—Continued good business in reinforcing bars is one bright spot. One **Pittsburgh** mill reports best shipments of the year in May and an even better June in prospect as the construction season gets under way. But hot-rolled and cold-finished bar business is not encouraging. The apparent lag in July orders has hit here. In addition, there was less apparent price hedge buying and overall bar inventories continue to be trimmed by many users.

Tinplate — This market continues to move along comparatively better than others. Food products are relatively immune from the severe effects of the recession, although much still depends on weather and crops to determine the outlook for canners.

Wire Products — National Wire Products Corp., Baltimore, has reduced its price $5 per ton mill producing plant, Baltimore, on welded wire concrete reinforcement building mesh. This reduction brings National Wire's price into line with Pittsburgh and Portsmouth mill prices. Company spokesmen say the reduction is made partially to meet foreign competition. National Wire's Tampa, Fla., price is unchanged.

PURCHASING AGENT'S CHECKLIST

Warehouses continue to invest more money in services, products. **P. 75**

Beryllium Corp. has more metal to sell, seeks new outlets. **P. 82**

Cost of buying new machines may be less than not buying. **P. 98**

COMPARISON OF PRICES

(Effective June 17, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**: declines appear in *Italics*.

	June 17 1958	June 10 1958	May 20 1958	June 18 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvalized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.275
Light rails	6.50	6.50	6.50	6.25
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.625
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

	June 17 1958	June 10 1958	May 20 1958	June 18 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.97	$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cin'ti	73.87	73.87	73.87	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.47	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganese 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.49	$64.56
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$37.50	$35.50	$57.50
No. 1 steel, Phila. area	33.50	33.50	34.00	56.50
No. 1 steel, Chicago	*34.50*	35.50	32.50	54.50
No. 1 bundles, Detroit	31.50	28.50	23.50	46.50
Low phos., Youngstown	37.50	37.50	37.50	56.50
No. 1 mach'y cast, Pittsburgh	48.50	47.50	48.50	56.50
No. 1 mach'y cast, Phila.	47.50	47.50	47.50	56.50
No. 1 mach'y cast, Chicago	*46.50*	47.50	44.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$35.17*	$35.50	$34.00	$56.17
No. 2 bundles	*25.83*	26.50	25.50	47.50
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.38
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	26.50	25.00	25.00	32.00
Copper, Lake, Conn.	26.50	25.00	25.00	32.00
Tin, Straits, N. Y.	*94.50*†	95.125	94.25	98.125
Zinc, East St. Louis	10.00	10.00	10.00	11.00
Lead, St. Louis	*10.80*	10.80	11.80	13.80
Aluminum, virgin ingot	26.10	26.10	26.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Sales Outlook Dim, Market Weakens

Prospect of slow steel operations through July gives the market a weaker tone.

Question is whether dealers will hold out for the expected upturn in the fall.

▪ In the absence of any bullish factors in the near future, the market has taken on a weaker tone.

Although no major buying appears on the immediate horizon, prices are not likely to drop significantly while there are hopes of a business upturn in the fall. Anticipation of an improved market then will be weighed against the probable July letdown in steel operations.

In some markets, the recent buying flurry gave dealers just enough encouragement, and cash, to resist short-term attempts to break the market. However, declines in Chicago indicated an end to the recent boomlet there.

The market on the East Coast was encouraged by some sales to mills that had been out of the market for months. However, mills were able to buy at going prices or even $1 lower, so the market was unchanged to weaker in spite of the sales. The export outlook is dim.

As a reaction from the recent upturn, the current market is slightly off. But dealers, even where they are willing to unload small tonnages at lower prices, are not committing themselves for large sales and brokers are again concerned about drying up the market.

As the result of the drop in Chicago, The IRON AGE No. 1 heavy melting Composite price dropped off to $35.17 from $35.50.

Pittsburgh — Prices are holding here as the market has taken on a slightly firmer tone. The recent flurry of buying has given dealers a little cash and they are stubbornly resisting lower prices. Flow of scrap into small yards has fallen off. At the same time, mill demand is weaker than ever. The few buyers seem to be tapering off and the biggest consumers show no signs of entering the market.

Chicago — This market drifted downward on small shipments. Broker concern over placing of long-term commitments, however, indicates concern over available scrap supply. Dealers continue to reduce their prices, but are not committing themselves to large orders.

Philadelphia — Two area mills which were out of the market for many months bought limited tonnages of No. 2 bundles and heavy melting scrap at quoted prices. The buys have stirred some optimism, but no runaway market is in sight. Especially since another mill has held up shipments on No. 2 bundles and prospects for July export orders are dim.

New York — Steelmaking grades have fallen $1 a ton to a top of $27 for No. 1 heavy melting. Export orders have petered out and no new business is in sight. Small orders sustain present prices on blast furnace and cast grades.

Detroit — The market remains static, pinned between low demand and low supply. An expected falloff of industrial scrap output in July has the effect of holding prices steady, despite low volume of shipments to mills. A buying flurry late last week pushed prices up as much as $3 for No. 1 heavy melting, but orders were quickly filled and the gains failed to hold.

Cleveland — Prices are coasting along at present levels. Most dealers are counting on a pickup in late summer and early fall. A good portion of excess dealer scrap has been drained off for current operating expenses. The recent price flurry has stepped up collections and industrial lists are going out of the district for under paid prices. One mill scheduled to start up melting operations in July should bring some life to the market.

St. Louis—Unaffected by weakness in other Midwest markets, this market continues strong. Only price changes are for stove plate and rerolling rails, up $1 and $2 respectively.

Birmingham — This market is very quiet. The few sales made this week were at quoted prices. Dealers report scrap coming into the yards has dropped to less than 50 pct of normal.

Cincinnati — Short term market future hinges on how operations hold up in July. At present, they are healthy, based on a rush for June delivery. Scrap movement has dwindled to a trickle.

Buffalo—The market is in the doldrums with no price changes. Dealers are expecting the inactivity to last through the summer months.

Boston — There are no price changes here, and very little scrap is moving in the district. The possibility that export may be lost for July and possibly longer give little rise for optimism.

West Coast—Dealers don't look for any revival of business during July. Most mills have good inventories and are buying very little.

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SCRAP PRICES *(Effective June 16, 1958)*

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and ms. turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	40.00 to 41.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	53.00 to 54.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	175.00 to 185.00
18-8 turnings	105.00
430 bundles and solids	100.00 to 105.00
410 turnings	45.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	44.00 to 45.00
Low phos. punch'gs plate	41.00 to 42.00
Low phos. 2 ft and under	39.00 to 40.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	47.00 to 48.00
Rerolling rails	54.00 to 55.00
Rails 2 ft and under	51.00 to 52.00
Locomotive tires cut	48.00 to 49.00
Cut bolsters & side frames	45.00 to 46.00
Angles and splice bars	49.00 to 50.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	36.00 to 37.00
Cast iron brake shoes	37.00 to 38.00
Cast iron wheels	34.00 to 35.00
Malleable	50.00 to 51.00
Stove plate	37.00 to 38.00
Steel car wheels	43.00 to 44.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	100.00 to 105.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	15.00 to 16.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Clean cast. chem. borings	24.00 to 25.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft and under	39.00 to 40.00
Low phos. punch'gs	39.00 to 40.00
Elec. furnace bundles	34.00 to 35.00
Heavy turnings	28.00 to 29.00
RR steel wheels	42.50 to 43.50
RR spring steel	42.50 to 43.50
Rails 18 in. and under	56.00 to 58.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	41.00 to 42.00
Malleable	58.00 to 59.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast.	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	39.00 to 40.00
Rails, random length	43.00 to 44.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	32.00 to 33.00
Drop broken cast.	45.00 to 46.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	24.50 to 25.50
No. 1 dealer bundles	32.50 to 33.50
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	20.50 to 21.50
No. 1 busheling	32.50 to 33.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut structural & plates, 2 ft & under	38.00 to 39.00
Drop forge flashings	32.50 to 33.50
Low phos. punch'gs plate	33.50 to 34.50
Foundry steel, 2 ft & under	35.00 to 36.00
No. 1 RR hvy. melting	35.00 to 36.00
Rails 2 ft and under	53.00 to 54.00
Rails 18 in. and under	54.00 to 55.00
Railroad grate bars	14.00 to 15.00
Steel axle turnings	17.00 to 18.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	46.00 to 47.00
Stove plate	42.00 to 43.00
Malleable	58.00 to 59.00
Stainless	
18-8 bundles	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles	85.00 to 90.00
430 turnings	35.00 to 40.00

Buffalo

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	26.00 to 27.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Low phos. plate	32.00 to 33.00
Structurals and plate, 2 ft and under	35.00 to 36.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
RR steel wheels	36.00 to 37.00
RR spring steel	32.00 to 33.00
RR couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	39.00 to 40.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	36.00 to 37.00
Rails, random lengths	45.00 to 46.00
Rails, 18 in. and under	50.00 to 51.00
Angles and splice bars	43.00 to 44.00
Std. steel car axles	51.00 to 52.00
RR specialties	41.00 to 42.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	35.00 to 36.00
Stove plate	39.00 to 40.00
Cast iron car wheels	36.00 to 37.00
Rerolling rails	55.00 to 56.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rails, random lgth.	43.00 to 44.00
Rails, 18 in. and under	47.00 to 48.00
Angles & splice bars	39.00 to 40.00
Rerolling rails	46.00 to 47.00
No. 1 cupola cast.	49.00 to 50.00
Stove plate	49.00 to 50.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	38.00 to 39.00

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	17.50 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	37.00 to 38.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	23.00 to 24.00
No. 2 dealer bundles	15.00 to 16.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	32.00 to 33.00
Charging box cast.	31.00 to 32.00
Heavy breakable cast.	31.00 to 32.00
Unstripped motor blocks	22.00 to 23.00
Stainless	
18-8 prepared solids	145.00 to 150.00
18-8 turnings	45.00 to 50.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	28.00 to 29.00
Drop forge flashings	27.00 to 28.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Low phos. punch'gs plate	30.00 to 31.00
No. 1 cupola cast.	36.00 to 38.00
Heavy breakable cast.	26.00 to 27.00
Mixed cupola cast.	37.00 to 38.00
Automotive cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	75.00 to 80.00
430 bundles and solids	80.00 to 85.00
410 turnings	20.00 to 25.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	3.00 to 4.00
Mixed bor. and short turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	14.00 to 15.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	22.00 to 23.00

San Francisco

No. 1 hvy. melting		$32.00
No. 2 hvy. melting		30.00
No. 1 dealer bundles		28.00
No. 2 bundles		22.00
Machine shop turn.		15.00
Cast iron borings		15.00
No. 1 RR hvy. melting		32.00
No. 1 cupola cast.		45.00

Los Angeles

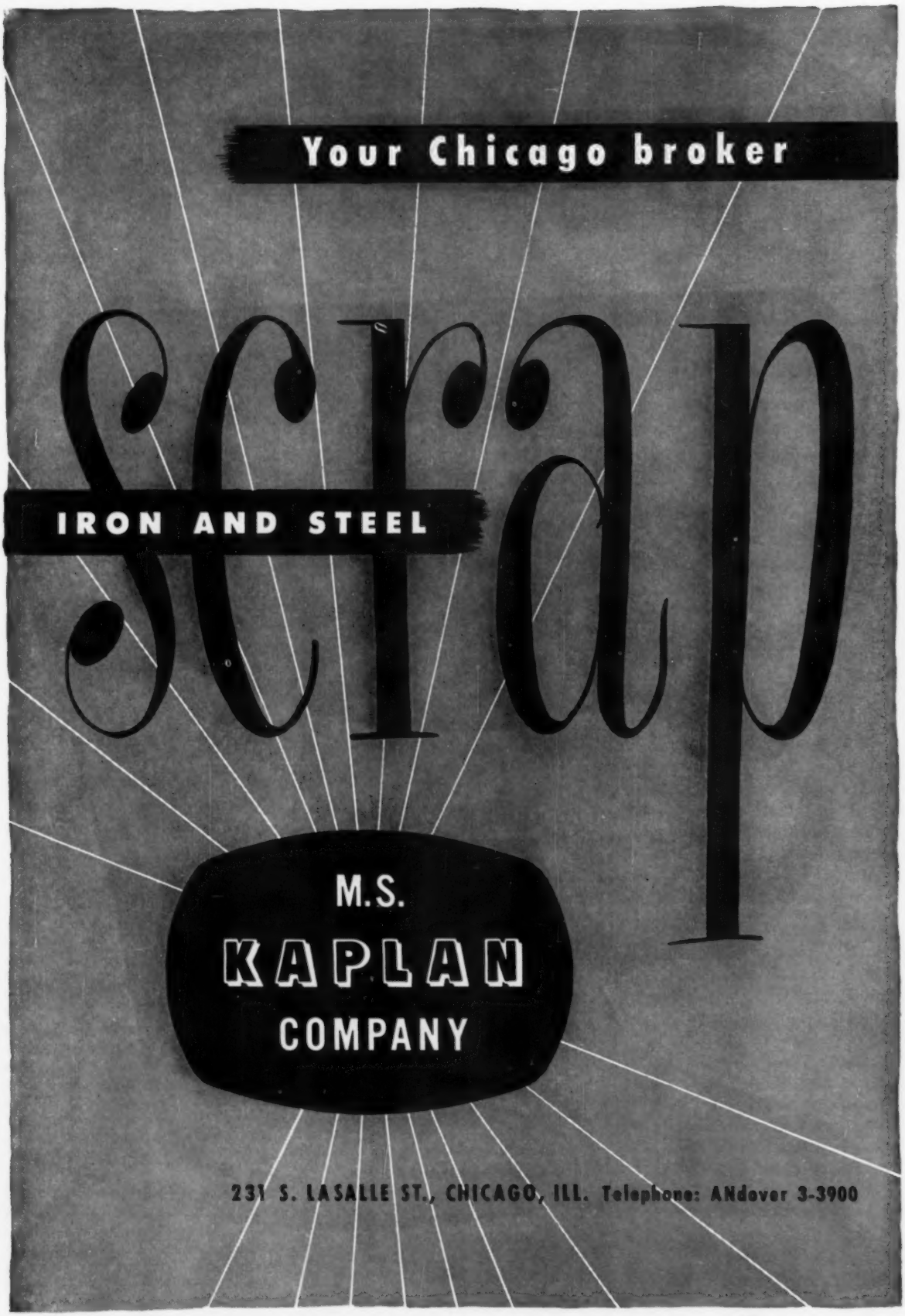
No. 1 hvy. melting		$32.00
No. 2 hvy. melting		30.00
No. 1 dealer bundles	$27.00 to	28.00
No. 2 bundles		17.00
Machine shop turn.	9.00 to	11.00
Shoveling turnings	11.00 to	13.00
Cast iron borings	11.00 to	12.00
Elec. furn 1 ft and under (foundry)		43.00
No. 1 RR hvy. melting		33.00
No. 1 cupola cast.	41.00 to	42.00

Seattle

No. 1 hvy. melting		$30.00
No. 2 hvy. melting		28.00
No. 2 bundles		22.00
No. 1 cupola cast.		36.00
Mixed yard cast.		36.00

Hamilton, Ont.

No. 1 hvy. melting		$30.00
No. 2 hvy. melting		26.00
No. 1 dealer bundles		30.00
No. 2 bundles		23.00
Mixed steel scrap		25.00
Busheling		20.00
Bush., new fact., prep'd		30.00
Bush., new fact., unprep'd		24.00
Machine shop turn.		15.00
Short steel turn.		19.00
Mixed bor. and turn.		15.00
Rails, rerolling		39.00
Cast scrap	$45.00 to	50.00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House Action Dooms Tariff Hikes

Ease with which Reciprocal Trade extension passed in the House indicates Ike's liberal trade policy has gained strength.

Nonferrous producers are getting reconciled to a modified version of the Seaton Plan.

▪ It looks like domestic mining and refining industries asking protection from increased import competition are going to have to do things the Eisenhower Administration's way.

The ease with which the President's request for extension of the Reciprocal Trade Agreements and broader tariff cutting powers passed the House indicates the tide is shifting in favor of liberal traders.

Washington observers point out the bill was expected to gain most of its support in the House. But they admit the President garnered more strength than had been anticipated, and it is now unlikely the Senate will make any basic alterations in the House-passed measure.

The Problem—The basic issue is this: Many domestic copper, lead, zinc, and lately aluminum producers say foreign competition has certain production advantages, such as lower labor cost, which permit them to undersell domestic producers in U. S. markets. There have been many congressional bills, and plans officially suggested by protectionists, to restore balance. Most depend on either high tariffs when domestic prices are forced below certain levels, or import quotas.

The administration admits something must be done to aid domestic nonferrous industries. But they say higher tariffs or import quotas are out because either would seriously hamper our foreign policy. The House-passed Reciprocal Trade Agreements extension gives the President the power to cut tariffs by 25 pct in five years.

Won't Hamper Imports — The Administration wants to support domestic nonferrous industries at lower levels than the industries have asked, with stockpiling and/or direct subsidies, which would not hamper imports.

Protectionists are gaining more advocates. Among the latest is the National Assn. of Waste Material Dealers. Charles Rubenstein, president, Metal Dealers Div.; and William Glassenberg, president, Secondary Metal Institute, formally registered opposition to the Administration's Domestic Minerals Stabilization Bill (Seaton Plan). They told Sen. James E. Murray (D., Mont.), chairman of the Interior and Insular Affairs Committee, the bill would disrupt existing price relationships between primary and secondary metals and sabotage their competitive position.

T. E. Veltfort, managing director, Copper and Brass Research Assn., also reiterated his opposition to the Seaton Plan because it does not help the brass mills. Any effort to help copper producers will be largely futile unless the brass mills are in sound condition, he insisted.

On Record—But many Washington sources say these supporters merely want to go on record before nonferrous representatives sit down with the Administration to work out a compromise based on the Seaton Plan.

A tentative compromise for copper has already been worked out. Instead of paying the producers a direct subsidy, the government proposes to stockpile 150,000 tons in a year at the market price, not to exceed 27½¢ per lb.

Copper was a natural place to start modifying Interior Secretary Fred Seaton's support proposal. The major producers are large corporations which do not need or want direct subsidies.

Copper Flurry—Nevertheless, the news of the stockpiling proposal and other market developments caused a major market flurry. Following a series of price increases by custom smelters, Anaconda led off among producers with a 1.5¢ increase to 26.5¢ per lb.

Custom smelters, who had boosted prices to 26¢ while producers held to their 25¢ level, immediately followed. And, speculation was they might edge up further.

The producers are not overjoyed at the stockpiling proposal. They would still prefer tariffs, which they say would disrupt competitive positions a lot less. And some are concerned about the stockpiled metal eventually coming back on the market.

Reconciled — But they concede that stockpiling is a vast improvement over subsidies. No one will

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.00	26.00	4/1/58
Aluminum ingot	28.10	28.10	4/1/58
Copper (E)	26.50	25.00	6/16/58
Copper (CS)	26.50	26.00	6/16/58
Copper (L)	26.50	25.00	6/16/58
Lead, St. L.	10.80	11.30	6/3/58
Lead, N. Y.	11.00	11.50	6/3/58
Magnesium ingot	36.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.00	12/6/56
Titanium sponge	185-200	200-250	4/1/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see next page; other primary prices, pg. 162.

say so in so many words, but it looks like the producers are just about reconciled to stockpiling instead of higher tariffs.

Charles E. Schwab, chairman, Emergency Lead-Zinc Committee, again indicated a 4¢ tariff when the domestic price of lead dropped below 17¢ per lb, and zinc below 14½¢ per lb is the fairest solution. But then, possibly seeing the handwriting on the wall, he suggested certain changes in the Seaton plan to make it more acceptable to domestic lead and zinc miners.

Lead-Zinc Suggestions—Changes suggested by Mr. Schwab:

Stabilization payments should be made on 600,000 tons of zinc per year. The current plan will pay up to 550,000 tons.

Maximum payment per lb of both metals should be 4¢. Current plan sets a top of 2½¢ per lb of zinc, and 3⅜¢ per lb of lead.

The government should take 100,000 tons of lead and 200,000 tons of zinc off the market in the first year.

Some method must be found to preclude the problem of getting an annual appropriation from Congress to support the program. There has been talk of legislation to permit borrowing of Treasury funds.

Tin

Major New York dealers say that while there is some slight increase in demand over a month ago, business is still bad.

Dealers are openly antagonistic toward the International Tin Council. One dealer says the current squeeze caused by increased sales of Russian tin in Free World markets, and the U. S. recession has brought out ITC's true colors. "They are only interested in getting the maximum price in the dollar market," he said.

Tin prices for the week: June 11—94.75; June 12—94.75; June 13—94.625; June 16—94.50; June 17—94.50.*

* Estimate

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FABRICATED HEAT AND CORROSION RESISTANT ALLOYS

BIG maintenance savings

BIG furnace covers

These heavy 309-S Stainless covers are literally "big as a house"... about 20′ x 8′ x 4′. Previous designs were the best available, but the customer told us it took a skilled welder at least one shift a week to keep the seven covers in service. Use of Rolock's unique "corrugated" construction, with provision for proper expansion and contraction in service, essentially eliminates all of this maintenance.

This is just one more example of the improved performance and substantial savings credited to Rolock's engineering approach to tough fabrication problems, when coordinated with our extensive modern plant facilities and specialized skills in high heat-resistant alloy fabrication.

Today, Rolock is producing a wide range of important equipment in the fields of furnace hoods, covers and bells, pit-type furnace retorts and equipment, vacuum retorts, pressure and vacuum vessels, in addition to standard equipment fabricated in the high heat-resistant alloys.

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MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	44.6	42.3	41.1	41.7
5052	52.0	46.9	45.2	44.4
6061-0	49.4	45.0	43.2	43.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	45.0-46.8	58.4-62.1
12-14	45.7-47.2	59.3-63.8
24-26	49.0-49.5	70.1-74.8
36-38	58.0-58.6	94.2-97.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜-⅝	¾-1	1¼-1½
Price	61.0	60.5	59.0	56.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 & .00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	108.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Chot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13		45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07		41.38	50.48
Munts Metal	45.19		41.00	
Bomm. Bz.	46.98	47.52	46.92	49.54
Mang. Bz.	50.81		44.91	
Phos. Bz. 5%	67.17		67.67	

Free Cutting Brass Rod 31.03

TITANIUM

(Freight included in 5000lbs)

Sheet and strip, commercially pure, $8.50-$10.10; alloy, $15.95; Plate, HR, commercially pure, $6.00-$6.75; alloy, $8.75-$9.50. Wire, rolled and/or drawn, commercially pure, $6.50-$7.00; alloy, $10.00-$11.50; Bar, HR or forged, commercially pure, $5.25-$5.50; alloy, $5.25-$6.35; billets, HR, commercially pure, $4.10-$4.35; alloy, $4.10-$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadium, del'd ..... $ 1.55
Calcium,, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb).... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $2.25
Iridium, dollars per troy oz.... $70 to $80
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $228 to $231
Nickel oxide sinter at Cooper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz.. $19 to $21
Platinum, dollars per troy oz... $62 to $70
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 88.625
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 27.00
- No. 120 ..... 26.25
- No. 123 ..... 25.75

80-10-10 ingot
- No. 305 ..... 31.25
- No. 315 ..... 29.25

88-10-2 ingot
- No. 210 ..... 38.25
- No. 215 ..... 34.00
- No. 245 ..... 30.75

Yellow ingot
- No. 405 ..... 22.75

Manganese bronze
- No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.00-24.25
- 0.60 copper max. 23.75-24.00

Piston alloys (No. 122 type).. 23.25-24.25
No. 12 alum. (No. 2 grade)... 21.00-21.75
108 alloy 21.50-22.25
195 alloy 24.00-25.50
13 alloy(0.60 copper max.).... 23.75-24.00
AXS-679 (1 pct zinc) 21.25-22.25

(Effective June 16, 1958)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.00-23.50
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.00-18.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14½
Red brass	18⅝	17⅞
Comm. bronze	19⅛	18½
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	22
No. 2 copper wire	21
Light copper	18⅝
*Refinery brass	20⅜
Copper bearing material	19¾

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	22
No. 2 copper wire	21
Light copper	18⅜
No. 1 composition	19⅛
No. 1 comp. turnings	19
Hvy. yellow brass solids	13½
Brass pipe	15
Radiators	15⅛

Aluminum

Mixed old cast.	11½—12
Mixed new clips	15 —15½
Mixed turnings, dry	13 —13⅛

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	20½—21
No. 2 copper wire	18½—19
Light copper	16½—17
Auto radiators (unsweated)	12½—13
No. 1 composition	16½—17
No. 1 composition turnings	15½—16
Cocks and faucets	13½—14
Clean heavy yellow brass	11½—12
Brass pipe	13½—14
New soft brass clippings	14 —14½
No. 1 brass rod turnings	11½—12

Aluminum

Alum. pistons and struts	5 — 5½
Aluminum crankcases	9 — 9½
1100 (2S) aluminum clippings	12½—13
Old sheet and utensils	9 — 9½
Borings and turnings	6 — 6½
Industrial castings	9 — 9½
2024 (24S) clippings	10½—11

Zinc

New zinc clippings	4 — 4½
Old zinc	3 — 3¼
Zinc routings	1¾ — 2
Old die cast scrap	1½ — 1¾

Nickel and Monel

Pure nickel clippings	42-45
Clean nickel turnings	37-40
Nickel anodes	42-45
Nickel rod ends	42-45
New Monel clippings	28-29
Clean Monel turnings	20-23
Old sheet Monel	25-26
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	6¾— 7
Battery plates (dry)	2⅛— 2½
Batteries, acid free	1½— 1¾

Miscellaneous

Block tin	75 —76
No. 1 pewter	59 —60
Auto babbitt	39 —40
Mixer common babbitt	9½—10
Solder joints	13¼—13¾
Siphon tops	42
Small foundry type	10½—10⅝
Monotype	10¼—10½
Lino. and stereotype	9¼— 9½
Electrotype	8¼— 8½
Hand picked type shells	6¼— 6⅝
Lino. and stereo. dross	2¼— 2½
Electro dross	1⅝— 2

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*		7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$98.50 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					4.925 *G3, M2*	7.15 *M2,D1, D2,G3,P11*	7.325 *G3*	10.60 *D2* 10.50 *G3*	8.10 *G3*	15.05 *G3*
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1-Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.925 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Owensboro, Ky.	$77.50 *G5*	$96.00 *G5*	$114.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*		5.275 *W3*	4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3* 9.20 *C1*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			4.925 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective June 16, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes° *1.25*-lb. base box	Electro° *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	4.925 *G3, M2*	6.05 *G3 M2*				7.275 *G3*	8.975 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.025 *G2*	6.15 *G2*	6.70 *G2*	6.725 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*	6.625 *T2*					6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

° COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.

(Effective June 16, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.25 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.625 *L4*	
	Conshohocken, Pa.							5.10 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio	5.90* *R3*		7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,13*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.425 *G3*	5.425 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5 G3*	8.775 *R5* 8.975 *B5,P3, P8*	7.925 *G3*	5.10 *G3*		7.20 *G3*	7.625 *G3*	
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.20 *G2*				
	Kokomo, Ind.		5.525 *C9*									7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Owensboro, Ky.	5.425 *G5*			6.475 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R5,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.75 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.68 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.425 *A8*									7.65 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.20 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

 * Special Quality (Effective June 16, 1958) † Merchant Quality—Special Quality 35¢ higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25		.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower d'scounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective June 16, 1958)

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over ..... 10.5¢
F.O.B. Riverton or Camden, New Jersey, west of Miss. River .... 9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River ..... 10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River ..... 9.5¢
Canadian sponge iron, del'd in East, carloads ..... 10.5¢
Atomized iron powder, 98% + Fe, 40 mesh,, F.O.B. Easton, Pa., in 100 lb bags ..... 7.7¢
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb. bags. Freight allowed east of Miss. River..... 10.5¢
Atomized iron powder, 98% + Fe. Cutting and scarfing grade, F.O.B. Easton, Pa. ..... 8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe .... 27.5¢
domestic 99.5+% Fe .... 36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe 57.0¢
Electrolytic iron melting stock, 99.84% pure ..... 27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe.. 88.0¢ to $2.85
Aluminum, freight allowed.. 38.00¢
Brass, 10 ton lots ..... 31.1¢ to 47.1¢
Copper, electrolytic ..... 41.50¢
Copper, reduced ..... 40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd ... $5.00
Lead, f.o.b. Hammond, Ind. . 19¢
Manganese f.o.b. Extron, Pa. 46.0¢
Molybdenum, 99% ..... $3.60 to $3.95
Nickel, chemically precipitated $1.05
Nickel, unannealed $1.00
Nickel, annealed $1.06
Nickel, spherical, unannealed #80 ..... $1.13
Silicon ..... 43.50¢
Solder powder .....13¢ plus met. value
Stainless steel, 302 ..... $1.02
Stainless steel, 316 ..... $1.30
Tin .....14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.15 (nominal)
Zinc, 5000 lb & over.....17.5¢ to 30.7¢

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Pct. Discounts: Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
⅝ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
⅝ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws *Discount (Packages)*

Full Finished H. C. Heat Treat

New std. hex head, packaged	C-1018 Steel Full-Finished Cartons	Bulk
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+6	+32
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Quantity	Discount Mach. Screws	Stove Bolts
Cartons		60	60
Bulk			
To ¼" diam. incl.	25,000-and over	60	..
5/16 to ⅜" diam. incl.	15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In Cartons		16	19
In Bulk			
⅜" diam. & smaller	25,000 and over	14	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Rolled elliptical, 18 in. or longer, 5000 lb lots 40.00
Electrodeposited 31.25
Brass, 80-20, ball anodes, 2000 lb or more 44.00
Zinc, ball anodes, 2000 lb lots 16.00
(for elliptical add 1¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225
(Rolled depolarized add 3¢ per lb)
Cadmium 1.55
Tin, ball anodes $1.13 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 68.70
Copper sulphate, 100 lb bags, per cwt. 22.15
Nickel salts, single, 100 lb bags.... 40.50
Nickel chloride, freight allowed, 300 lb 48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 24.05
(Philadelphia price 24.50)
Zinc cyanide, 100 lb 60.75
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 10,000 lb or more 31.00

CAST IRON WATER PIPE INDEX

Birmingham 125.8
New York 138.7
Chicago 140.9
San Francisco-L. A. 148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structure	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	10.69*	16.28	15.28	19.83	19.08
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	16.38	15.38	19.93	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.15*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.25	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.35	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.29	18.69
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		7.10	8.05	.....	7.25	8.05	7.25	7.20	11.10	16.20	15.25	19.65	18.95
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles		9.70**	9.50	11.80	8.90	8.85	8.70	8.75	12.10*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12 11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.93	14.93	19.48	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	16.19	15.19	19.74	18.99
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	10.02	8.79	8.87	8.60	8.75	11.61*	16.11	15.11	19.66	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.90	14.80	19.35	18.60
Portland		10.00[1]	11.75[2]	13.30[3]	11.95[4]	10.10[5]	11.10[6]	9.85[7]	11.34*	18.50	17.45	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.05	17.15	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	8.74	9.08	9.25	9.12	9.56	16.16	15.16	19.71	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. † Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36" x 120"; [2] 20 ga. x 36" x 120"; [3] 26 ga. x 30" x 96"; [4] ⅛" x 1" in lots of 1000 to 9999; [5] sheared plate ¼" x 84" in lots of 1000 to 9999; [6] 3" x 5.70" in lots of 1000 to 9999; [7] M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective June 16, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	2	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	Plate (*A3, J2, L4, C4*) 15 pct	Plate (*A3, J2, L4, C4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.56	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975	.....	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	14.75
So. Chicago *R3*	.....	.....	.....	9.75	.....	.....	.....
Ensley *T2*	5.525	6.50	.....	.....	.....	.....	.....
Fairfield *T2*	.....	6.50	.....	9.75	.....	6.60	.....
Gary *U1*	5.525	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	5.525	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B3*	5.525	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	5.525	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B3*	5.525	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.625	.....
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor	.....	12.10	.....
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55	Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*) $2 a ton higher; Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unbored.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	26.00	40	100,110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	16.00

(Effective June 16, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Simple Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Am'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	8.65	9.20
Aliquippa *J3***	173	190	...	...	190	8.65	9.325
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4*****	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dav. *M4***	175	192	...	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	...	212	193	8.65	9.20
Duluth *A5*	173	187	...	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	...	212	193	8.65	9.20
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	...	219	203	9.00	9.675
Johnstown *B3***	173	190	172	...	196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	...	212	193	8.65	9.20
Kokomo *C9**	175	189	...	214	195*	8.75	9.30*
L. Angeles *B2*****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	...	217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	...	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	.....	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	...	193	8.65	9.20
So. Chicago *R3*	173	187	.....	...	193	8.65	9.20
S. San Fran. *C6*†	.....	.....	.....	236	.....	9.60	10.15†
SparrowsPt. *B3***	175	.....	.....	214	198	8.75	9.425
Sterling, Ill. *N4*****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*‡	179	.....	.....	.....	.....	8.95	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*...	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67 00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68 00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66 50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66 50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00 Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2.* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9,* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3,* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *J3;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6;* Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5,* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owenboro, Ky., *G5;* Bridgeport, Conn., *N8.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R5;* Watervliet, *A3;* Pittsburgh, Chicago, *U1* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8.*

(Effective June 16, 1958)

MUNDT

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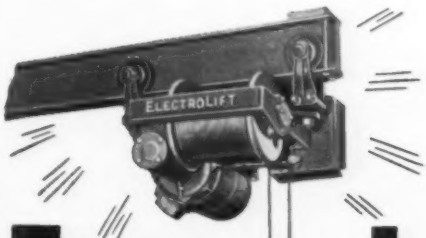

ELECTROLIFT

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The ElectroLift worm-drive hoists—in capacities from ¼ to 10 tons . . . compact design requiring minimum headroom . . . superior braking power . . . simplicity of operation—are noted for their productive and dependable long life. Consult your local ElectroLift representative, or write for a complete catalog.

ELECTROLIFT

5844

204 Sargeant Avenue Clifton, N. J.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
0.10% C, 52-57% Cr, 2.00% max Si. 37.50
7-8½% max C, 50-55% Cr, 3-6% max Si 22.50
7-8½% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton (Bulk)	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Packed, pallets, 3000 lb up to carloads	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots .....|	$2.95	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective June 16, 1958)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	10.35¢
Ton lots	11.70¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.00
Less ton lots.....	4.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $3.80

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over

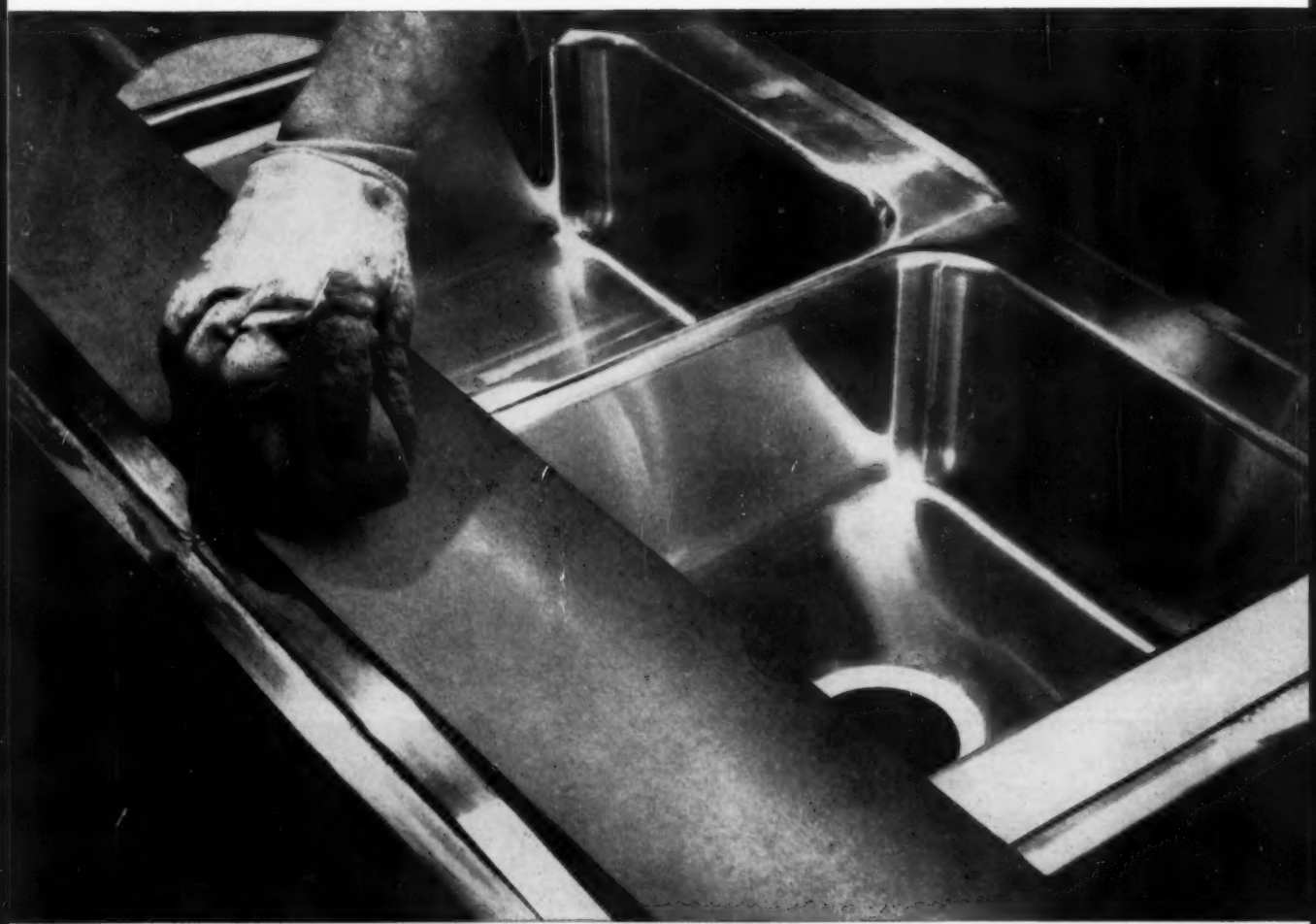
No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

* **Stainless Steel polishing information:**



*Play it cool and don't press

You can polish Stainless Steel to a mirror finish but you can't rush the job. Too coarse a grit, too much speed, too much pressure might scorch or discolor Stainless because steels of this family are not rapid heat conductors.

Use light pressure on the polishing agent, and remember that you can't get a desired finish any faster just because you press harder. Take your time. This is by way of saying that Stainless Steel isn't difficult to fabricate, it's just different.

All your work on Stainless will be expert if you follow the "Stainless Steel Fabrication Book." If you don't have a copy, we'll be glad to send you one. Write on your company letterhead to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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United States Steel Corporation–Pittsburgh
American Steel & Wire–Cleveland
Columbia-Geneva Steel–San Francisco
National Tube–Pittsburgh
Tennessee Coal & Iron–Fairfield, Alabama
United States Steel Supply–Warehouse Distributors
United States Steel Export Company

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Light and heavy machinery for all classes of sheet metal, plate and structural work.

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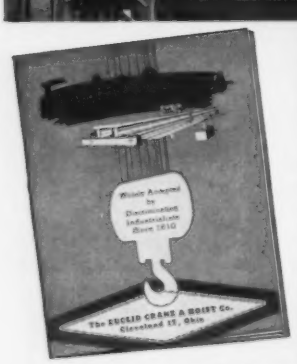

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26 pages of informative data and complete information on many Euclid Cranes depict how our cranes will benefit your material handling, manufacturing and assembling operations.

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HIGHEST QUALITY • RELIABLE PERFORMANCE • MINIMUM MAINTENANCE

An investment in a Euclid Crane pays off many times in reliable, trouble-free service for an unusually long period of time.

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HOIST LITERATURE IS AVAILABLE UPON REQUEST

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CAPACITIES TO 10 TONS

The EUCLID CRANE AND HOIST Co.

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Today . . JAPAX puts you years ahead in machining techniques

The JAPAX D-103 Automatic Precision Spark Discharge Machine

Designed and Field Proven to Accomplish the Most Difficult Machining Jobs, JAPAX Is the Ultimate in Modern Spark Discharge Equipment.

JAPAX Offers You These Important Advantages;

1. Low Initial Cost . . . less than many single operation tools.
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3. Efficiency . . . operates for hours unattended automatically.
4. Compactness . . . occupies only 16 sq. ft. floor area. (D-103)

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JAPAX AMERICA CORPORATION
P.O. Box 3626 Seattle 24, Wash.

WILLIAMS-WHITE HYDRAULIC GAP FRAME PRESSES

- **Sensitive and positive control of bending ram**
- **Self-contained hydraulic pumping unit and motor**
- **Adjustable stroke and hydraulic pressure**
- **Integral oil reservoir**

The above are standard features built into every WILLIAMS-WHITE Hydraulic Gap Frame Press. Regularly built in capacities from 15 tons, with cast or welded steel plate frames, their simple design, sturdy construction, accessible work area, low initial cost and long, trouble-free life are factors to be considered when purchasing a hydraulic press for bending and straightening operations. Why not discuss your requirements with us before you buy?

The press illustrated has 100 tons capacity, 120" x20" removable table, 20" daylight and 16" stroke. It is located in a plant of North American Aviation, Inc.

BUILDERS OF MACHINERY SINCE 1854

WILLIAMS-WHITE & Co.
302 EIGHTH ST. • MOLINE, ILLINOIS
PRESSES • BULLDOZERS • BENDERS • PUNCHES • SHEARS

REPRESENTATIVES
CALIFORNIA, Los Angeles: George A. Davies Machinery Co.
MISSOURI, St. Louis or Kansas City: Robt. R. Stephens Machinery Co.
NEW YORK, Buffalo: H. D. Thweatt Co.
OHIO, Cincinnati: Columbus or Dayton: Seifreat-Elstad Machinery Co.
OREGON, Portland: Allied Northwest Machine Tool Corp.
PENNSYLVANIA, Pittsburgh: Frank Ryman's Sons
Wynnewood (Phila.): Edw. A. Lynch Machinery Co.
WASHINGTON, Seattle: Perine Machinery and Supply Co.
WISCONSIN, Milwaukee: Pagel Machinery Co.

ELECTRICAL POWER EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. F.V.	475	330
1	3000	New Whse.	Enc. F.V.	525	600
1	2250	New Elliott	Enc. F.V.	600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	New Elliott	Enc. F.V.	250	175/350
4	1500	New Whse.	Enc. F.V.	525	600
1	1375	G.E.	MCF	415	1300
1	1300	G.E.	MCF-12	600	300/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
1	940	Whse.	QM	250	140/170
2	800	G.E.	MCF	250	400/750
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/720
1	750	G.E.	MCF	600	120/360
4	600	Whse.		250	275/550
1	500	G.E. B.B.	TLF-2656H	250	2000/3600
1	500	G.E.	MPC-10	250	188/400
3	450	Whse.		550	415
2	400	G.E.	CY-275	300	1000/1500
1	380	Cr.Wh.	H-102 B.B.	250	1200
2	300	G.E.	MPC	220	400
2	275	G.E. B.B.	TLC-108	250	2000/4000
1	225	G.E. B.B.		250	1150/3600
1	200	Rel. B.B.	T-564-D.P.	240	1750
1	200	Rel. B.B.	T-663-D.P.	240	1150
1	200	Rel. B.B.	T-664-D.P.	240	850
1	200	Whse.	CB-207.4	250	850/1200
1	150	Cr.Wh.	CMC-65H	230	1150
1	150	G.E. B.B.	TLC-74	250	1150/3500
1	150	Rel. B.B.	T-663-D.P.	240	850
1	150	G.E. B.B.	CD	600	250/750
1	120	G.E. B.B.	TLC-50	250	1950/5000
1	125/150	New Whse.	CB-210.3	230	300/1200
1	120	Rel. B.B.	1050T	230	375/900
1	125	Whse.	SK-199	230	450/1200
2	125	Whse.	SK-185	230	350/1050
1	100	G.E.	CDP-115	250	1750
2	100	Whse.	SK-181	230	450/1000
1	75	Rel. B.B.	T-663 D.P.	240	520
1	75/100	Rel. B.B.	T-664-D.P.	240	400/1600
1	75	G.E. B.B.	CD-1235-D.P.	600	850
1	60/75	Rel. B.B.	T-664-D.P.	240	300/1200
1	60/80	Rel. B.B.	T-563-D.P.	240	650/1950
2	60	Rel. B.B.	T-466-D.P.	240	1750/2400
1	50	Rel. B.B.	T-465-D.P.	240	1750
1	40	Rel. B.B.	T-465-D.P.	240	1750
6	40	Rel. B.B.	385F. TEFC	230	500/1500
1	30/40	Rel. B.B.	T-564-D.P.	240	300/900

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.

2—150 KW, G.E., Ignitron, 245 V. D.C.—220 V. A.C., air cooled transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	600	600	2300/4150
2	1000	G.E.	720	600	6600/13200
2	750	G.E.	720	250/300	6600/13200
1	500	Whse.	900	125/250	440
1	500	G.E.	900	125/250	440
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2200
1	200	G.E.	1200	250	440/550
1	200	Whse.	1200	550	2200
1	200	El. Mfg.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	125	440
1	140	Cr.Wh.	690	125/250	2300
1	100	G.E.	1176	250	220/440
1	100	Cr.Wh.	1800	240	440
2	100	Cr.Wh.	1200	125	220/550
1	100	G.E. (unused)	1200	250	2400/4160
2	75	Whse.	1200	125	440
1	125	G.E.	1800	250	220/440
1	240	Whse.	900	125	220/440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4800/4200/4160
3	1000	G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800x85/55-265/165
3	500	Kuhl	OISC	1	13200 x 6600
3	333	G.E.	OISC	1	13200 x 2530/4380Y
3	150	G.E.	OISC	1	33000x2300/4000Y
3	100	Whse.	SK	1	4600x460/230/115
3	333	G.E.	OISC	3	2400/4160Y x 600

CRANE & MILL MOTORS

230 V., D.C.

Qu.	H.P.	Make	RPM	Type
14	12/15	Whse.	700/600	MCA-30, Series
1	20	Whse.	975	K-5, Series
2	28	G.E.	650	MDS-408-AE-2 sh.
2	25	G.E.	725	CO-1808, Series
1	35	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. S.B.
3	50	G.E.	650	COM-1830 Comp.
3	50	Whse.	525	CK-9 Shunt R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	550	MD-412AE 2 Comp. R.B.
1	50	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 Series S.B.
6	100/140	Whse.	500/415	MC-90 Series R.B.

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Cleveland Auction Brings Good Prices

Liquidation sale brings surprisingly good prices for most of the tools placed on the block.

Milling machines, lathes, shapers, presses and grinders all moved well and brought some spirited bidding.

▪ Prices paid for used machine tools at a Cleveland liquidation auction last week indicated buyer hesitancy is getting to be a thing of the past.

Machine tools, office equipment and other assets of Sylvania Electric Products Co. of Cleveland, a modern tool and die shop, were sold out to the walls by efficient auctioneers of Industrial Plants Corp. of New York and Chicago. Prices brought by larger machine tools were a surprise to most dealers.

Sales Figures — Highest priced unit was a 1952 No. 2 Cincinnati universal milling machine which brought $9500. It was a dial type with 21 spindle speeds, 20 to 1500 rpm with a working table surface of 12 x 54 in. with motor and control.

A No. 2H Kearney & Trecker vertical milling machine with 10 by 15 in. table and 35 to 1400 rpm speed range brought $3000. A model J Bridgeport turret type vertical milling machine with 9 by 36 in. table fetched $1000.

Good Prices—Other top priced machine tools were a 1953 Monarch geared head engine lathe which brought $7250. It had push button control, motor in the base, two chucks, a taper attachment and 16 spindle speeds to 1000 rpm.

A 1945 Monarch lathe 12 by 30 in. with a geared head brought $4700. A Hardinge high speed bench lathe with motor and control brought $3000 and a 16 in. by 6 ft South Bend engine lathe brought $800.

Shapers Moved Well — Shapers also brought good prices. Leader was a 20 in. Gould & Eberhardt crank shaper with motor, control and 14 in. Universal vise which brought $5000. A 20 in. Cincinnati heavy duty crank shaper similarly equipped brought $2500 and a smaller 16 in. type brought $1900. Another 20 in. Cincinnati utility crank shaper brought $1700.

A 105 ton capacity open back inclinable press was the second highest priced item, just a shade under the Cincinnati milling machine. The No. 7 Verson press brought $9250 in spirited bidding. It was single geared, 8 in. stroke, with 30 by 39 in. bed and equipped with air clutch, air cushion in bed, inching controls, air counter balance ram, motor and control. Other OBI presses ranged from $1500 to $450. A 56 ton Cleveland brought $1500, a 3 in. stroke Cleveland brought $700.

Grinders in Demand — Surface grinders got a good play and 14 almost identical units were all bunched between $875 and $1100. They were all No. 2 Hammonds with 6 by 18 in. working tables, hand feeds with motorized spindles, push button control, magnetic chuck and work lights. A No. 15 Gallmeyer & Livingston surface grinder similarly equipped brought $375.

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10 ton Shaw	120' Span	230 Volt D.C.
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120 ton Shepard Niles	77' Span	220/3/60

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600 ton HPM Fastraverse, Bed 36" x 36"
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2	1250	Whse.	720	600	4160/2400
1	1250	G.E.	450	132/265	4160/2400
2	500	Whse.	1200	125/250	4000/2300
8	300	Whse.	1200	125/250	4000/2300
1*	300	Al. Ch.	1200	250/300	2300
1	250	G.E.	1200	250	440
8	200	Whse.	1200	125/250	4000/2300
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1	300	Whse.	MPC	600
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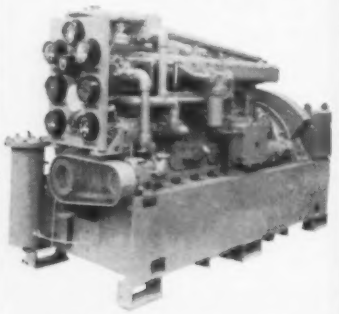

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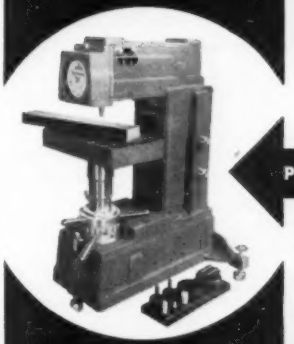

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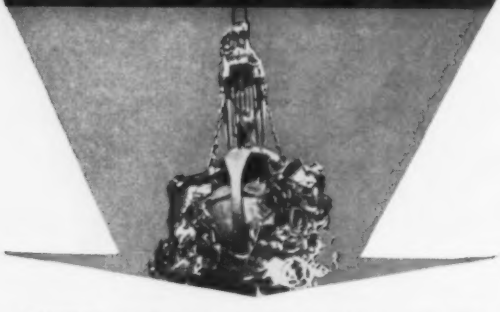

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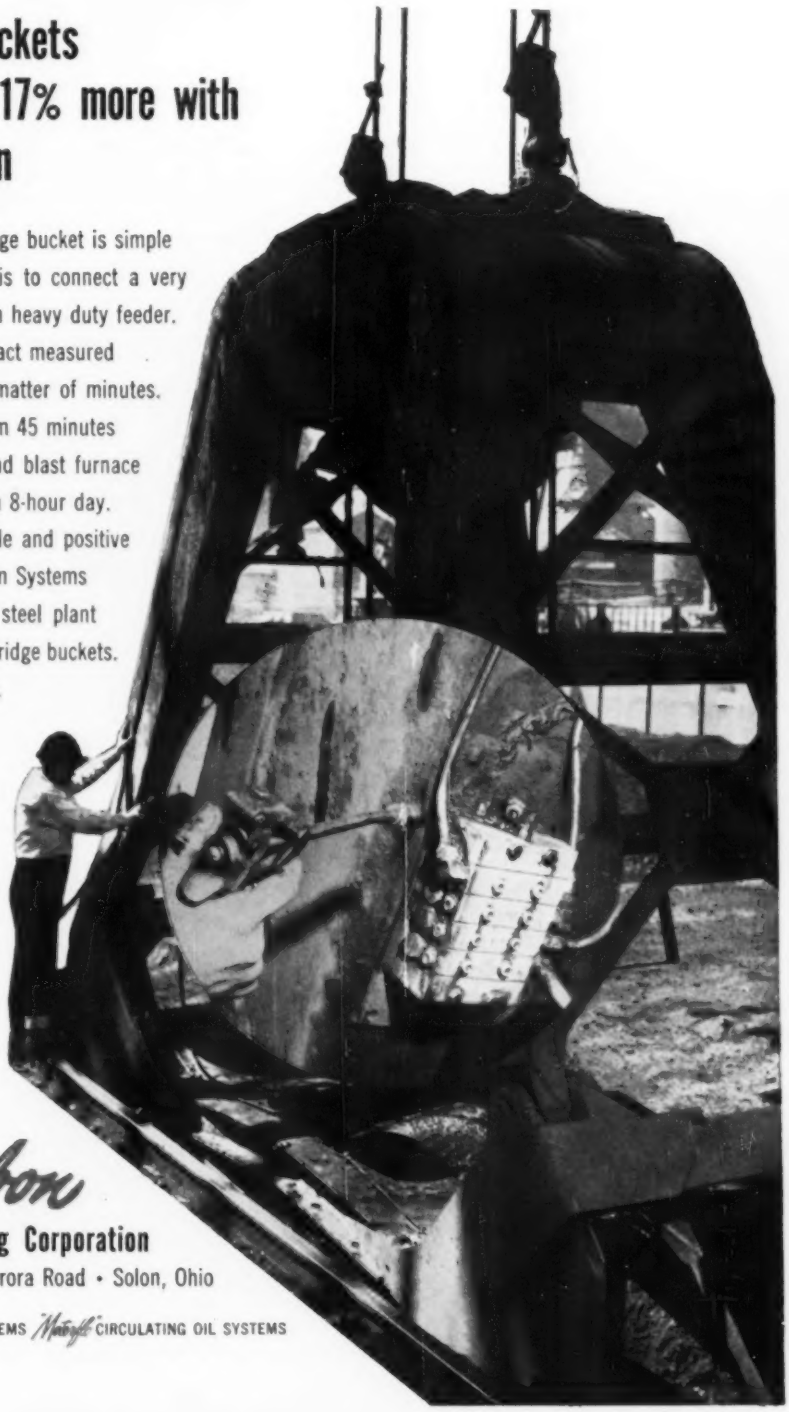

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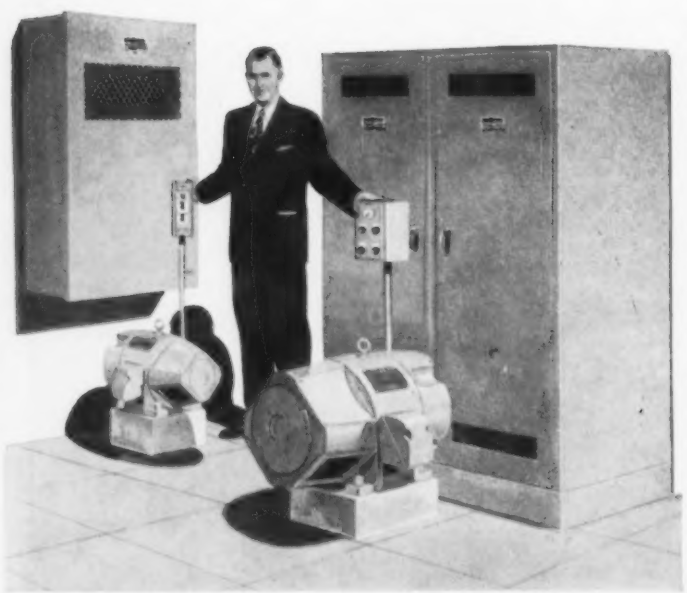

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